Sturgeon County

July 2020

Resource Extraction Regulatory Review

Aggregate Industry Best Management Practices (BMPs)

A summary of the current aggregate regulatory framework and potential tools & metrics for municipalities to consider when evaluating planning applications for aggregate extraction & processing activities

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SECTION 1.0: EXECUTIVE SUMMARY

Sturgeon County contains valuable aggregate deposits, especially within the Calahoo-Villeneuve area extending along the south side of the Sturgeon River from the City of St. Albert to the Hamlet of Calahoo in addition to the sand deposits located in the eastern and central portions of the County. Aggregate extraction activities have been occurring in the Calahoo-Villeneuve area for over thirty (30) years. Although these deposits are currently being progressively extracted, they will eventually be depleted or become uneconomical to extract due to land use restrictions.

Aggregate resources within the County are valued because of their high-quality and proximity to local and regional markets. Of the known aggregate deposits within the Sturgeon River watershed, about 50% have been extracted, approximately 20% is under active extraction and processing and only half of the remaining area is likely to be mined in the future due to uneconomical conditions or inaccessibility due to land use restrictions.

The County's current land use regulations restrict aggregate extraction activities in accordance with fixed minimum development setbacks in accordance with an over-riding objective of limiting negative impacts between rural industrial, residential and agricultural uses.

On June 25, 2019, Council directed administration to initiate a review of the County's existing resource extraction setbacks and prepare potential modifications to ensure the municipality is most effectively leveraging opportunities to benefit from the responsible management of this diminishing resource. The Resource Extraction Regulatory Review further seeks to establish a balance between the economic, social, health, and environmental outcomes related to resource extraction.

The core principles, evaluation criteria and performance standards described in this report are a summary of BMPs that industry and municipalities may choose to adopt to better plan, regulate and operate aggregate industries at the local level. Implementation of performance standards can be an effective tool to compel aggregate operators to plan, design, operate and maintain their pits in a manner that reasonably mitigates potential for negative impacts to surrounding landowners, both individually and cumulatively.

Seven (7) core principles have been proposed as a guiding framework for this report.

Core Principle	Description
Principle 1: Compliance with laws	Aggregate extraction activities are tightly regulated. Aggregate activities should meet or exceed the requirements of all applicable laws in the jurisdictions in which they occur.
Principle 2: Community consultation and involvement	Inclusive and transparent stakeholder involvement in all major steps of the aggregate resource improves public understanding. The pursuit of more collaborative efforts earlier on in aggregate approval processes can lead to better solutions, better decisions and better outcomes.
Principle 3: Respect for First Nations rights and culture	The legal, customary and asserted rights of First Nations peoples to protect their cultural heritage and to own, use and manage their lands, territories, and resources should be recognized and respected.
Principle 4: Benefits to local communities and workers	Aggregate extraction activities should serve to maintain or enhance the long-term social, economic and environmental well-being of local communities in which activities occur.
Principle 5: Environmental & water impacts and site stewardship	Aggregate extraction activities, including their identification, siting, footprint design, operation, rehabilitation, and other ecological initiatives, are designed to protect, restore or improve biological diversity and its associated values, water resources, soils, and to protect unique and fragile ecosystems and landscapes, and by so doing, maintain the ecological functions and integrity of the area and its connections to the regional landscape.
Principle 6: Deploying the natural resource to achieve a greater good	The efficient use and conservation of aggregates is best achieved by putting them to their highest valued use, maximizing the use of recycled content by looking for alternatives to using high quantities of in-situ aggregate resources and, in the medium to long term, developing optimal transportation networks that factor in both financial and environmental costs.
Principle 7: Traceability	Systems should be put in place to track the movement of aggregate resources from certified extraction and processing operations through to their end uses.

To support the summary of BMPs contained in this report, Sturgeon County administration polled a variety of municipal jurisdictions (within and outside the Edmonton Metropolitan Region) relative to the management of aggregate development. A total of nine (9) municipalities responded to a brief survey with a verbatim transcript of responses included in the Appendix. The Land Use / Zoning Bylaws of eleven (11) additional municipalities were reviewed to draw comparisons among the management of aggregate extraction in municipalities in Alberta and in the Okanagan (*Refer to complete Jurisdictional Review Summary in Appendix 2*). In general terms, most respondent municipalities acknowledged that, although not all actively track the supply of aggregate resources locally, each have a sense that demand appears to be increasing. As such, most municipalities are experiencing considerable controversy implementing various processes to regulate aggregate activities due to tensions that often arise between aggregate and non-aggregate developments.

The summary of Best Management Practices (BMPs) contained in this report are what the County could adopt to continue facilitating responsible extraction of aggregate resources with strategies to assess, evaluate and monitor various operational metrics that could mitigate potential negative impacts between aggregate operations and adjacent landowners. The BMPs described in this report are not meant to be 'all inclusive' given that local conditions and circumstances relative to proposed aggregate operations often vary. As such, the application of *all* the BMPs may not be appropriate within the County's context. However, they are meant to provide 'food for thought' to inform and support the County's resource extraction regulatory review process.

SECTION 2.0: INTRODUCTION

2.1 REPORT OBJECTIVE

The objective of the report is to provide a summary of the existing regulatory framework relative to the extraction of aggregate resources within Sturgeon County. Concurrently, the report summarizes a list of potential Best Management Practices (BMPs) which the County may wish to consider as part of the ongoing regulatory review process of their existing resource extraction policies and bylaw prescriptions.

The BMPs described in this report are intended to facilitate an approach that considers science-based evaluation metrics that can be more specifically measured, verified and monitored on an ongoing basis to mitigate potential negative impacts between aggregate operations and surrounding landowners. This BMPs summary is intended to provide a 'thought piece' for administration and Council to consider while contemplating potential amendments to the County's existing aggregate regulatory framework.

It is noted that the adoption of a combination of appropriate BMPs at various stages of the municipality's planning approval process could help ensure that aggregate extraction activities continue to occur within the County in a manner that respects the needs of local stakeholders without compromising the long-term sustainability of the in-situ aggregate resources.

2.2 AGGREGATE '101'

For this report, the term 'aggregate' refers to sand, rocks, gravel, crushed stone, shale and any rock product that is mined out of the ground. These products are used in all types of construction. Everything from roads, schools, and houses to hospitals, bridges, and water treatment plants require aggregates to be built. As a non-renewable natural resource, much like oil or gas, aggregates must be protected and respected.

Aggregates are non-renewable resources found only in locations where natural processes have placed them. The Edmonton Metropolitan Region has traditionally enjoyed the benefit of a close supply of large aggregate reserves. However, these reserves are depleting due to impacts of rapid urbanization and subsequent sterilization of gravel deposits caused by development encroachment.

Once land containing in-situ aggregate is developed, access to the resource is highly unlikely. If an aggregate supply is not sourced locally, it must be hauled in from another municipality or region. The farther the aggregate supply needs to

travel from distant sources, the more expensive it becomes for local markets. Additionally, local communities are subjected to increased vehicle emissions, industry is forced to incur additional fuel costs, and municipal roads and highways experience more wear and tear from the increased truck traffic required to haul aggregates over the longer distances.

Accommodating opportunities for local extraction supports the increasing need for aggregate to keep pace with demand created by ongoing population growth throughout the County and Region. Maintaining stable opportunities to develop these resources is critical to the success of surface materials industries.[1]

As producers and consumers, the Aggregate Industry contributes to the growth of Alberta's oil & gas, construction, and environmental economies. The demand for aggregate extraction on public land has increased significantly in recent years and allocation has become more complex as users compete for limited resources. According to a recent study published on the Alberta Sand and Gravel Association website[2], there are 2,622 active aggregate operations in production across the province servicing an amount of aggregate valued at $934M. The industry employs about 2,232 people with 2,098 full time equivalent positions (FTE). The economic impacts of the aggregate industry within the province are significant with about $1.524B in direct and indirect outputs contributing $479.6M to the provincial GDP.

[1] South Saskatchewan Regional Plan, pg. 50.

[2] Economic Impact Study of the Aggregate Industry in Alberta, MNP LLP, January 2018

SECTION 3.0: REGULATORY FRAMEWORK

The aggregate industry is tightly regulated. Companies that mine aggregates must adhere to a regulatory framework governed by a variety of federal, provincial and municipal policies and regulations. The following sections provide a brief summary of this framework.

3.1 FEDERAL LEGISLATION

Many federal departments enforce various Acts that dictate actions that can be undertaken by aggregate operators on public and private lands. Key Federal Acts include the Fisheries Act and the Migratory Birds Convention Act, the Species at Risk Act, the Navigable Waters Protection Act (NWPA) and the Canadian Environmental Assessment Act (CEAA). Key federal regulatory requirements that may apply to an aggregate operation on public lands are summarized in the following table.

Act	Responsible Agency	Description
Fisheries Act	Fisheries & Oceans Canada	Protects fish and their habitat across Canada.
Fisheries Act	Environment Canada	Prevents the deposition of deleterious substances into fish bearing waters.
Migratory Bird Convention Act	Canadian Wildlife Service	Protects migratory birds, their eggs and their nests from harmful activities.
Species at Risk Act	Environment Canada	Provides protection for the recovery of threatened and endangered species and encourages the management of all other species to prevent them from becoming at risk.
Navigable Waters Protection Act (NWPA)	Transport Canada	Protects the public right to navigation in all navigable waters.
Canadian Environmental Assessment Act (CEAA)	Environment Canada	Requires federal department to conduct environmental assessments for prescribed projects and activities before providing federal approval or financial support.

3.2 PROVINCIAL LEGISLATION

Many provincial departments enforce Acts and Policies that dictate actions that can be undertaken by aggregate operators on public and private lands. Key Provincial Acts include the Law of Property Act, Public Lands Act, Water Act, Wildlife Act, Forest Act, Environmental Protection and Enhancement Act, Provincial Wetland Policy, Soils Conservation Act, Weed Control Act, Alberta Land Stewardship Act, Mines and Minerals Act, Historical Resources Act, ERCB D-50 Directive – Water Pump Off, Indigenous Consultation and the Municipal Government Act (MGA).

Key federal regulatory requirements that may apply to an aggregate operation on public lands are summarized in the following table.

Act	Provincial Ministry	Description
Law of Property Act	Alberta Municipal Affairs	Regulates how surface and mineral property rights are addressed and provides that sand, gravel, clay and marl that may be recovered by surface operations considered to be the property of the surface owner.
Public Lands Act	Alberta Environment & Parks (AEP)	Requires approvals for activities taking place on public land under the Public Lands Administration Regulation of the Minister of ASRD, as well as the beds and shores of all naturally occurring rivers, streams, watercourses and lakes, under the administration of the Minister of ASRD. The Disposition and Fees Regulation grants approvals to extract aggregate on public land.
Water Act	Alberta Environment & Parks (AEP)	Regulates the allocation, protection and conservation of water within Alberta. The "Code of Practice for Watercourse Crossings" directs all watercourse crossings and requires that notice be submitted to the Minister prior to conducting any instream works.
Wildlife Act	Alberta Environment & Parks (AEP)	Prohibits the disturbance of wildlife habitation. The Wildlife Regulation identifies the wildlife, areas and times of year to which the Act applies.

Forest Act	Alberta Agriculture and Forestry	Requires approval for any forest management activity (e.g. timber harvest) which occurs on public land.
Environmental Protection and Enhancement Act (EPEA)	Alberta Environment & Parks (AEP)	Requires a review of proposed projects that may cause an adverse effect on the environment, and the reclamation and conservation of land. Key regulations that may apply to the operation of pits on private land include: Conservation and Reclamation Regulations and the Pesticide Regulation. The "Code of Practice for Pits" falls under the Conservation and Reclamation Regulation. It applies to all pits on private land; however, only pits that are greater than 5 ha are required to be registered by AEP.
Provincial Wetland Policy	Alberta Environment & Parks (AEP)	Regulates the process of classifying wetlands, and in some instances, wetland disturbances subject to compensation.
Soils Conservation Act	Alberta Agriculture and Forestry	Requires that landholders (the occupant or owner of the land) take appropriate measures to prevent soil loss or deterioration or, if it is occurring, stop the loss or deterioration from occurring on their land.
Weed Control Act	Alberta Agriculture and Forestry	Governs the legislation of restricted, noxious and nuisance invasive plant species or weeds via the Weed Control Regulation.
Alberta Land Stewardship Act	Alberta Environment & Parks (AEP)	Regional plans will consider the combined impact of all activities on the land, air, water and biodiversity, and will be developed with advice from all Albertans.
Mines and Minerals Act	Alberta Energy	Governs the management and disposition of rights in Crown owned mines and minerals, including the

		levying and collecting of bonuses, rentals and royalties.
Historical Resources Act	Alberta Culture, Multiculturalism and Status of Women	Purpose is to preserve, protect, and present historical and archaeological resources of provincial, national and international significance.
ERCB D-50 Directive – Water Pump Off	Alberta Environment & Parks (AEP)	Requires that a Temporary Field Authorization be issued prior to pumping pit water onto public land. Toxicology testing may be required prior to obtaining a permit.
Indigenous Consultation	Alberta Indigenous Relations	Ensures First Nations peoples are appropriately consulted.
Municipal Government Act	Alberta Municipal Affairs	Enables broad governance powers for municipalities, including planning and permitting approvals.

3.3 PROVINCIAL APPROVAL PROCESS

The *Environmental Protection and Enhancement Act (EPEA)* presides over all aggregate extraction in Alberta and provides for the enactment of other regulations. Regulatory control of aggregate extraction and processing is split between the municipal and provincial governments depending on the size of the pit and its ownership.

Aggregate extraction on all public land and on private land where the development is less than 5 ha in area is governed by the *EPEA*, together with the *Conservation and Reclamation Regulation* and *Water Act*. These are categorized as Class II pits by Alberta Environment. Class I pits are those on private land which are greater than or equal to 5 ha in size. They are subject to the requirements of the *Code of Practice for Pits*, the *EPEA* and the *Conservation and Reclamation Regulation*.

Municipalities do not generally distinguish between Class I and Class II pits in respect of implementing their Land Use Bylaws and both categories require land use planning approval in some form. Each pit over 5 ha must be registered with Alberta Environment and this involves submission of an Activities Plan covering multiple aspects of the aggregate operation. The *Code of Practice for Pits* sets out the requirements for the Activities Plan and lists numerous items to be addressed, including pit water monitoring and discharge measures, groundwater levels, soil movements, reclamation and control over infrastructure and access.

3.3.1 CODE OF PRACTICE FOR PITS

The *Code of Practice for Pits* was developed under the *EPEA* to ensure that all aggregate operators adhere to common operation and reclamation plans. The Code ensures that the desired environmental outcomes are met.

The *Code* defines Class 1 Pits as greater than, or equal to, five (5) hectares (12 acres) on private lands require Municipal and Provincial approval through Alberta Environment & Parks (AEP). These pits shall satisfy the requirements of the Land Use Bylaw, the *EPEA*, the *Code of Practice for Pits,* the *Water Act*, the Conservation and Reclamation Regulations and all other statutory or regulatory requirements which may be applicable.

Class 2 Pit are less than five (5) ha (12 ac), developed on private lands, and require municipal approval. These pits shall satisfy the requirements of the Land Use Bylaw and are subject to the requirements under the *EPEA*, the *Code of Practice for Pits,* the *Water Act*, the *Conservation and Reclamation Regulations* and all other statutory or regulatory requirements which may be applicable.

The Code requires all Class 1 pits (greater than 5 ha) to be registered. As part of the registration process the environmental implications of the proposed operation must be reviewed by AEP and financial security must be provided to ensure reclamation success at the end of the pit's operation. AEP has no equivalent provincial requirement to provide financial security for reclamation process for Class 2 pits.

3.3.2 RECLAMATION

AEP requires adequate reclamation security be posted by the operator before a Class 1 pit registration is granted. The amount of financial security is based on the third-party cost for reclamation of the proposed maximum disturbance of the pit during a specified time period.

Specific plans must be submitted to AEP regarding development details, conservation strategies, and reclamation plans for all aggregate mining proposals. This includes special considerations for water quality and surrounding vegetation and wildlife. Companies mining aggregate are required to provide the province reclamation security to be held until the mined area has been returned to equivalent land capacity.

Land must be reclaimed to a capability equal or better than prior to mining. Upon completion of operations, aggregate operators must receive a Reclamation Certificate from AEP and remain liable for all conservation and reclamation of the site until the certificate is granted.

End land-uses are site specific and will depend primarily on the pre-disturbance condition. The choice of an end land-use will depend on the following factors:

- Regional Limitations: The natural environment surrounding a site will strongly influence the types of end land-uses that are attainable. Climate, soil type,

and landforms available in the region will influence the plant types that can grow in the region. Vegetation on reclaimed land must be self-sustaining under normal management, which means plant communities becoming established and mature without an ongoing, external source of nutrients, water, seeds or seedlings.

- Size and Depth of the Excavation Area: In general, if a pit is less than 2 ha, it is recommended that any pit be returned to similar use as adjacent lands where possible. Shallow pits less than three (3) metres deep should not be used for fish habitat. Specific information regarding pit reclamation can be obtained from the "Guideline for Acquiring Surface Material Dispositions on Public Land".
- Surrounding Land Uses: The end land-use should be compatible with adjacent lands.
- Costs: The overall cost may dictate the type of land-use. Applicants must work with AEP prior to obtaining a license or lease to determine the end land-use. Costs for conservation and reclamation should be identified up front as it is not always appropriate to re-evaluate costs at the end of a pit life and determine that conservation and reclamation plans are cost prohibitive.

3.4 MUNICIPAL APPROVAL PROCESS

3.4.1 LAND USE AMENDMENT

The Sturgeon County Land Use Bylaw #1385/17 regulates resource extraction activities within the municipality. Section 11.2 – Resource Extraction District (RE) provides for the extraction, processing and stockpiling of on-site natural resources on lands. Once the reclamation process is complete, redistricting to the appropriate use is required. The RE District further describes various uses and regulations relative to subdivision, development, landscaping, site access and traffic, stripping, reclamation, hours of operation and hauling, dust control, development permit application requirements and approval intervals.

Alberta Environment & Parks (AEP) generally withholds its decision regarding applications filed under the *Code of Practice for Pits* until the municipality renders a decision on land use zoning. However, there is no explicit regulatory directive to this effect and efforts are made throughout the province to work with the local municipalities through the review process.

3.4.2 DEVELOPMENT PERMIT

The Code of Practice for Pits advises that the municipality's role with respect to approving aggregate operations is to regulate matters related to land use and deal with local community-based issues such as hours of operation, buffers, noise, dust, haul routes and traffic control through the development permit process. However, the municipal role has the potential to go beyond this and the

Municipal Government Act (MGA) allows for a more thorough approach to be taken on aggregate development by municipalities.

Sturgeon County regulates aggregate operations via the development permit process. As prescribed by Section11.2 of the Land Use Bylaw #1385/17, a development permit application for a natural resource extraction and secondary processing must include a copy of the application for registration under the Code of Practice and a copy of any application for approvals under the Water Act. In this manner, the County ensures the province's regulatory approval under the various Acts and Regulations is respected.

The County's Land Use Bylaw also provides broad discretionary authority to the County's Development Authority to require an aggregate operator to rationalize their request for a new or continued aggregate operation via verification of a variety of technical investigations relative to matters such as traffic, surface drainage, noise, dust, landscaping and other relevant considerations. In all cases, Section 11.2.4 of the RE District requires the following:

a) Development regulations for this district are at the discretion of the Development Authority in consideration of all application information.

b) Natural resource extraction activities having a disturbance area of less than 5.1 ha (12.6 ac) on a parcel at any time, including any associated infrastructure, stockpiles connected with the pit shall not be permitted.

c) The operating area of a natural resource extraction and secondary processing use shall not be located less than:

    i. 400 m (1,312.3 ft) from the outside wall of an existing dwelling to the nearest edge of the operating area of a natural resource extraction and secondary processing use.

    ii. Notwithstanding Subparagraph 11.2.4(c)(i), natural resource extraction and secondary processing may be permitted within 400 m (1,312.3 ft) of an existing dwelling where a provision is made regarding site-specific mitigation of noise, dust, visual, traffic, lighting and other effects of the sand and gravel operation as agreed to in writing by the resident(s) of the existing dwelling.

    iii. 800 m (2,624.6 ft) from the district boundary of a multi-lot subdivision, hamlet, or area subject to an approved planning document that includes residential development.

Although Section 11.2.4.c(ii) enables the Development Authority to exercise discretion to potentially reduce the 400 m setback, Section 11.2.4.c(iii) contains no such provision. As such, there is no opportunity to apply a best management practice approach to the consideration of potential extraction of aggregate resources within 800 m of a district boundary of a multi-lot subdivision, hamlet or area subject to an approved planning document that includes residential development.

SECTION 4.0: BEST MANAGEMENT PRACTICES

4.1 OBJECTIVES

When planning a new aggregate operation, there are many initiatives an operator can undertake to limit the potential for negative impacts to adjacent lands, and in doing so, be a better neighbour during the life span of an aggregate operation. Implementation of Best Management Practices (BMPs) by an aggregate operator can facilitate the initial planning and design of high-quality aggregate operations and establish procedures and protocols to at least lessen and/or completely mitigate negative impacts to landowners by responsibly addressing concerns as they arise during day to day activities.

The core principles, evaluation criteria and performance standards described in the following sections of this report are a summary of BMPs that industry and municipalities may choose to adopt to better plan, regulate and operate aggregate industries at the local level. The list of BMPs is not meant to be all inclusive given that local conditions and circumstances can and will vary. As such, application of all the BMPs may not be appropriate in all cases. However, they are meant to provide 'food for thought' to a municipality considering changes to their aggregate related policies, procedures and bylaw prescriptions.

4.2 CORE PRINCIPLES

The following seven (7) core principles are proposed as a guiding framework for these BMPs.

Principle 1: Compliance with laws

Aggregate extraction activities (i.e., identification and siting, footprint design, operation and rehabilitation) should meet or exceed the requirements of all applicable laws in the jurisdictions in which they occur.

Principle 2: Community consultation and involvement

Better public understanding of aggregate extraction activities can be achieved by inclusive and transparent stakeholder involvement in all major steps of the aggregate resource development process, including siting rationale, footprint design, operations planning and eventual rehabilitation. No one has answers to every potential issue related to aggregate operations. However, the pursuit of more collaborative efforts earlier on in aggregate approval processes can lead to better solutions, better decisions and better outcomes.

Principle 3: Respect for First Nations rights and culture

The legal, customary and asserted rights of First Nations peoples to protect their cultural heritage and to own, use and manage their lands, territories, and resources should be recognized and respected.

Principle 4: Benefits to local communities and workers

Aggregate extraction activities should serve to maintain or enhance the long-term social, economic and environmental well-being of local communities that they operate in.

Principle 5: Environmental & water impacts and site stewardship

Aggregate extraction activities, including their identification, siting, footprint design, operation, rehabilitation, and other ecological initiatives, are designed to protect, restore or improve biological diversity and its associated values, water resources, soils, and to protect unique and fragile ecosystems and landscapes, and by so doing, maintain the ecological functions and integrity of the area and its connections to the regional landscape.

Principle 6: Deploying the natural resource to achieve a greater good

The efficient use and conservation of aggregates and other resources is best achieved by putting them to their highest valued use, maximizing the use of recycled content by looking for alternatives to using high quantities of in-situ aggregate resources and, in the medium to long term, developing optimal transportation networks that factor in both financial and environmental costs.

Principle 7: Traceability

Systems should be put in place to track the movement of aggregate resources from certified extraction and processing operations through to their end uses.

4.3 LOCATION BASED EVALUATION CRITERIA

It is important to plan for the orderly development of new aggregate sites so that the resources can be extracted in a manner that is environmentally sustainable and minimizes potential negative impacts to residents, business owners and agricultural operators. There are various evaluation approaches that can help inform and guide the ideal location and timing of aggregate development as describe in the following sections.

4.3.1 ASSESS DEMAND FOR AGGREGATE RESOURCES

Municipalities should work with industry to ensure there is adequate supply of aggregate resources to keep pace with local and regional demand. Wherever possible, industry should avoid an oversupply of pits and aggregates which would result in production rates slowing and a more prolonged period of aggregate development within the municipality.

The preferred approach to determining the need for new aggregate extraction/processing sites is to calculate the existing capacity of permitted sites within the municipality and to compare this with forecasted production and sales rates within the municipality and the Region. This baseline figure of capacity could be monitored over time against fluctuating demand figures to better forecast remaining supply of aggregate when considering proposed new sites. It is important to recognize that an assessment of regional demand would need to be undertaken to accurately represent the consumption rate of the permitted reserves within the municipality.

4.3.2 MAP LOCATIONS OF AGGREGATE RESOURCES

To supplement the assessment of demand, municipalities should work with industry to comprehensively map the specific type, quality and location of aggregate resources in order to spatially consider them relative to considerations such as the regional transportation network, environmentally significant areas, residential communities, business development areas and other potentially incompatible uses both existing and contemplated.

4.3.3 PROTECT IDENTIFIED AGGREGATE RESOURCES

Once a municipality has determined the anticipated demand and in-situ location of aggregate resources, it should consider implementing strategies to prevent the unjustified sterilization of this resource. Without strategic protection, identified aggregate deposit areas may be impacted by development encroachments which can and often do create permanent barriers to extraction of the resources. It can also occur when conflicting land uses are established near to an aggregate resource, meaning that to extract that resource in future would result in unacceptable impacts being caused to those neighbouring land users.

As such, municipalities should implement strategic policies that establish 'aggregate protection zones' within which potentially incompatible developments may not be permitted unless it meets certain criteria. Such criteria for approval of new development within aggregate protection areas could include:

- Demonstration that the aggregate of concern is not of any value or potential value;
- Ensuring the affected aggregate resource can be extracted prior to the incompatible development taking place;
    - Ensuring the incompatible development is of a temporary nature and can be completed and the site restored prior to the resource being needed; or
    - Demonstration that there is an overriding need for the incompatible development which outweighs the loss of the aggregate resource.

4.3.4 PRIORITIZE RESOURCE EXTRACTION IN THE MOST SUSTAINABLE LOCATIONS

In planning the location of aggregate extraction/processing sites, it is suggested that certain areas within the municipality should be preferred to encourage sustainable extraction, transport and use of the resource. Examples of these areas are described in the following table.

Priority Area	Potential Benefits
Extension of existing sites	▪ Utilizes existing infrastructure (e.g. roads, plant site, buildings). ▪ Lessens the need to develop new sites with duplicate site operations. ▪ Site mitigation specific to the local area can be developed over time learning from previous extraction methods.
Extraction sites located in relative proximity to the market(s) they serve	▪ Reduces transport costs, emissions and impacts upon local communities. ▪ Encourages the exploitation of aggregate nearer to settlement areas where land is most at risk of future development pressures and landowner conflict, leaving more remote areas to be extracted later.
Sites already allocated for surface development	▪ Allows extraction of a resource which would otherwise certainly be lost. • Aggregate can be used to support immediately surrounding development of roads and infrastructure. • Encourages quick extraction. ▪ Promotes reclamation to a developable state.
Sites close to a current or future provincial highway or rail siding	▪ Limits aggregate traffic on County roads and directs it away from residential properties. ▪ Delays the need to upgrade County roads to a time when required by permanent development.

4.3.5 ENSURE SUSTAINABLE TRANSPORT OF AGGREGATE RESOURCES

Although the anticipated location of an aggregate operation is usually directly dependent upon the location of the in-situ resource, municipalities should ensure that appropriate access/egress is provided from the extraction sites, to the provincial highway network, and to the end users. Where an aggregate operation does not have an appropriate access, the potential to create negative impacts to surrounding landowners increases significantly (e.g. noise,

dust/ air quality, traffic safety, etc.). As such, municipalities should generally discourage aggregate operations which are remote from the intended market and distant from the regional paved transportation network.

4.3.6 CONSIDER CUMULATIVE IMPACTS

Aggregate deposits are normally concentrated within specific areas of the municipality where natural drainage and erosion processes have deposited them. As such, it is not uncommon for a concentration of multiple extraction/processing operations to operate within a specific geographic area which can lead to combined, or cumulative negative impacts being experienced by nearby communities. Increased noise, air quality, traffic and other effects can all be exacerbated when multiple aggregate operations are approved in relative proximity to one another. As such, it is crucial that these cumulative effects are comprehensively assessed and managed as part of the municipality's development permit approval process. Accordingly, municipalities should establish policies to establish criteria to assess and monitor cumulative impacts associated with the activities of multiple aggregate pits operating in proximity to evaluate matters such as:

- Hours of operation;
- Traffic safety;
- Noise levels;
- Air quality levels; and
- Groundwater quantity and quality.

Often, municipalities can manage cumulative impacts by adopting a regulatory framework that considers various performance standards to ensure aggregate operators appropriately mitigate the potential for negative impacts alongside a continuous monitoring framework and enforcement process that is directly tied to a development permit renewal interval. These performance standards are discussed in the following section.

4.4 PERFORMANCE STANDARDS

Implementation of performance standards can be an effective tool to compel aggregate operators to plan, design, operate and maintain their pits in a manner that reasonably mitigates potential for negative impacts to surrounding landowners, both individually and cumulatively. Unlike strategies to mitigate impacts through minimum setbacks, application of performance standards can enable the potential impacts of aggregate operations to be appropriately measured, monitored and controlled throughout the lifespan of the pit's mining

horizon. Additionally, application of performance standards can better equip both local authorities and aggregate operators to understand and address local stakeholder concerns in a more specific and effective manner as opposed to the application of arbitrary minimum setbacks.

By developing performance standards, a municipality can establish a set of common benchmarks to better assess all proposals for aggregate operations. These standards can provide the municipality with the necessary policy and technical guidance to evaluate aggregate applications, which are often very complex, while also promoting consistency and fairness within the industry and affected landowners. Once adopted, aggregate operators must comply with the performance standards when seeking approval for a new site or expansion of existing sites.

4.4.1 TRAFFIC

In planning aggregate development, trucking is typically the most publicly visible aspect of aggregate operation. It is often raised as a concern because of the trucking activity's potential to generate noise and dust, and to create both real or perceived issues relative to traffic safety and nuisance delays.

Traffic effects can be limited by the operator implementing a comprehensive traffic management strategy which includes both on-site and off-site mitigation measures. Off-site traffic management should include emphasis on appropriate routing of aggregate traffic to minimize safety conflicts with other vehicles and pedestrians. Some common methods to reduce the impact of trucking activities associated with aggregate operations include:

- Advance planning and designation of coordinated truck routes that utilize provincial highways (wherever possible);
- Corporate training to ensure all driver's understand routing requirements and safe driving requirements of the company, the industry, and the community in which they operate;
- An industry-supported driver behavior reporting and enforcement system such as the Truck Registry System operated by the Alberta Sand and Gravel Association;
- Regular industry consultation and cooperation with local police and traffic planning staff to coordinate truck route planning and enforcement initiatives;
- Providing for pedestrian crossings if applicable;
- Avoiding the overloading of trucks;
- Covering loaded trucks with tarps or sheets;
- Installing wheel washing facility to prevent mud on public roads;
- Fitting trucks with noise reducing mufflers; and

- Providing financing for upgrades to the local road system through implementation of Road Use Agreements, deploying funds collected under the Community Aggregate Payment (CAP) and/or a Transportation Off-site Levy Bylaw (TOL). Such improvements would normally be based on predicted truck traffic and established as part of a Traffic Impact Assessment (TIA).

Traffic Impact Assessment (TIA)

At the development permit application stage, aggregate operators should be required to provide the municipality with a Traffic Impact Assessment (TIA) to determine the anticipated volume of traffic associated with the proposed activities and an assessment of the capacity of the local/regional transportation system to accommodate. If required, the TIA should identify any recommended upgrades to the transportation network in the event its existing capacity cannot accommodate the expected increase in traffic generation. Traffic impact studies will count the existing traffic use on a roadway and compare that existing use with the roads designed capacity. TIA's can also consider future growth, such as the addition of more gravel pit(s) or a residential community on a roadway and add that to the expected traffic count. This is done through traffic modeling which uses development plans to estimate future traffic numbers and includes expected traffic patterns such as rush hours to determine congestion. The TIA can identify any existing or anticipated issues with traffic movement and provide recommendations for required road and/or intersection improvements that would increase the function and capacity of the transportation network if issues are identified.

Site Access Plan

At the development permit application stage, aggregate operators should be required to provide the municipality with a Site Access Plan which illustrates and describes how access to and from the proposed pit will be accommodated. Wherever practical and feasible, the main site entrance should be paved to reduce damage to the municipal road (if similarly paved) and to reduce the generation of dust. Likewise, the operator should demonstrate measures to reduce generation of dust within the pit's internal haul routes in accordance with the application of dust control measures (e.g. calcium chloride) and/or frequent watering.

Truck Haul Route Plan

At the development permit application stage, aggregate operators should be required to provide the municipality with a Truck Hall Route Plan to illustrate the typical routes haulers will travel to and from the pit location. The aggregate operator should be encouraged to direct trucking activities to the closest provincial highway resource road with measures being implemented to ensure the impacts to the affected municipal roads are minimized.

Truck Registry

The Alberta Sand and Gravel Association (ASGA) has developed a truck registry program in response to public and industry concerns on the perceived and real conduct of gravel truck traffic and the negative effects these concerns have on the permitting of haul roads and gravel resources. The goal of the program is to address these concerns through accountability, tracking and education. As a member of the program, aggregate haulers must display a common registry ID decal on their vehicles. This demonstrates commitment to the communities they travel through by making them easily recognizable. It encourages truckers to operate within existing laws, regulations and individual Supplier-Hauler agreements by providing and effective feedback loop. If someone has a complaint/concern about a registered truck, there is a toll-free number located on the ID decal. Complaints are recorded, investigated and tracked with haulers being notified and the person registering the complaint gets feedback and closure.

4.3.2 NOISE

Noise, or sound, is measured in decibels (dBA). Although noise can be scientifically measured, an individual's opinion as to what is considered "noisy" is subjective and can change with time, location, and experience and is not always related directly to the actual sound level. Noise from gravel operations comes from extraction activities, plant operations including crushing and screening, back-up beepers, aggregate stockpiling or trucking activities. While some of these noise sources may be more permanent in nature, others such as those associated with the stripping of overburden are temporary.

Reducing noise at its source is usually considered the most effective way to manage operating noises. Because sound carries easily over great distances without the presence of objects to baffle the noise, setbacks (e.g., minimum distance setbacks from a property line) are not always the most effective means of reducing noise related to aggregate operations.

Establishing appropriate hours of operation for extraction or shipping activities could be required to provide certainty to both adjacent landowners and aggregate operators themselves. It should be noted that if hours are too restricted, the duration or total number of years it takes to deplete the gravel will increase, or in certain cases the project could become unfeasible.

Noise Impact Assessment (NIA)

At the development permit application stage, aggregate operators should be required to provide the municipality with a Noise Impact Assessment (NIA) to evaluate the benchmark ambient noise levels occurring within the area of the proposed aggregate operation and any existing dwellings, typically within a 0.8 km radius. The NIA should then establish the amount of noise expected to be generated resulting from the aggregate operation relative to the ambient noise threshold. The expected increased noise level should be evaluated against applicable Noise Control Bylaws to ensure compliance. If the anticipated noise

thresholds exceed the municipality's bylaw requirements, the aggregate operator must implement appropriate mitigations to address the noise threshold exceedance. Methods to achieve noise reduction during operations include:

- Siting crushers and other stationary or semi-stationary plants away from adjacent sensitive activities and, most effectively, at the bottom of a pit where pit walls act as sound baffles;
- Enclosing stationary plants;
- Using smaller, quieter machines;
- Installing landscaped berms in strategic locations at the perimeter of the aggregate operation or within adjacent property (subject to landowner agreement and consent);
- Using upgraded mufflers on plant equipment and haul trucks;
- Replacement of back-up beepers with low frequency beepers or strobe lights when possible; and
- Setting appropriate noise limits.

It is noted that some municipalities do not have an applicable Noise Control Bylaw. In these instances, municipalities may direct the aggregate operator's noise thresholds to comply with the Alberta Energy Regulator's Directive 038 regarding Noise Control[3].

Noise Monitoring & Reporting

Ongoing monitoring and reporting can provide an effective way to ensure that an aggregate operator's noise mitigation methods are working effectively. The continuous monitoring of noise levels at an aggregate operation's property line and at adjacent dwellings can demonstrate that operations are complying with the municipality's noise control standards. Likewise, ongoing reporting of the results of the monitoring can reveal circumstances where violations are occurring and prompt the aggregate operator to implement measures to correct same. Municipalities may require an aggregate operator to post the results of ongoing noise monitoring on a website to be reviewed periodically and/or as infractions occur.

4.3.3 AIR QUALITY

3 https://www.aer.ca/documents/directives/Directive038.pdf

Air quality is determined by measuring the amount of two types of solids in the air: large particles called Total Suspended Particles (TSP), also called "dust", and smaller particles called Particulate Matter (PM). Dust (or TSP) from aggregate operations typically arises from crushing activities, stockpiling, screening, and driving on haul roads. The smaller particulate matter, or PM, is created mainly by burning diesel fuel in machinery during aggregate excavation/processing and trucking operations. An excessive level of a certain kind of particulate matter, $PM_{2.5}$, is associated with observed effects on human health including irritation and chronic issues within lungs and the cardiovascular system (Health Canada 2010). Alberta Environment has developed a stringent set of provincial air quality objectives and guidelines in order to protect human health which aggregate operations are required to adhere to.

Alberta Environment currently has the regulatory power to control emissions and act against breaches of air quality limits within municipalities. The province has also outlined appropriate air quality limits through the Alberta Ambient Air Quality Objectives (AAAQO) guideline document[4]. However, the AAAQO is not comprehensive and does not cover all potential emissions created by industrial activities. Municipalities may therefore seek to set air quality limits for aggregate development which are based on the AAAQO guidelines and established criteria set by other agencies.

Air Quality Assessment (AQA)

At the development permit application stage, aggregate operators may be required to provide the municipality with an Air Quality Assessment (AQA) to evaluate the benchmark ambient air quality occurring within the area of the proposed aggregate operation and any existing dwellings, typically within a 0.8 km radius. The AQA should then establish the anticipated changes in air quality expected to be generated resulting from the aggregate operation relative to the ambient air quality levels. If the anticipated air quality levels are expected to contravene the guidelines established by the Alberta Ambient Air Quality Objectives (AAAQO), the aggregate operator will be required to implement appropriate mitigations to address the contraventions.

Methods for reducing the production or release of dust and particulate matter during gravel operations include:

- Locating major driveways within the site away from dust sensitive land uses;

[4] https://open.alberta.ca/dataset/0d2ad470-117e-410f-ba4f-aa352cb02d4d/resource/4ddd8097-6787-43f3-bb4a-908e20f5e8f1/download/aaqo-summary-jan2019.pdf

- Treating access routes with dust suppressant, water, oil or paving to prevent dust from trucks and other moving equipment;
- Setting truck speed limits;
- Enclosing the crusher;
- Covering truck loads with tarps;
- Water spray at gravel transfer points;
- Retaining/establishing perimeter vegetation;
- Seeding of berms and stockpiles;
- Limiting the area of active extraction areas open at any one time by performing progressive reclamation;
- Reclaiming as pit areas are depleted; and
- Ceasing operations during exceptional windy and dry weather conditions.

Air Quality Monitoring

Ongoing monitoring and reporting can provide an effective way to ensure that an aggregate operator's air quality mitigation methods are working effectively. The continuous monitoring of air quality at an aggregate operation's property line and at adjacent dwellings can demonstrate that operations are complying with Alberta Environment's ambient air quality regulations. Likewise, ongoing reporting of the results of the monitoring can reveal circumstances where violations are occurring and prompt the aggregate operator to implement measures to correct same. Municipalities may require an aggregate operator to post the results of ongoing air quality monitoring on a website to be reviewed periodically and/or as infractions occur. To further ensure good air quality, the aggregate operator may install monitoring alarms set for any condition in which the hourly $PM_{2.5}$ and dust limits are exceeded. All hourly exceedances are recorded and checked to determine if the exceedance was due to operations, off-site factors such as forest fires and farming, wind or other conditions. Operating practices may require adjustments as required.

4.3.4 VISUAL IMPACTS & LANDSCAPING

Due to the footprint of aggregate operations and the lengthy time horizon during which extraction and processing activities can occur, the potential for negative visual impacts can be significant. However, provincial regulations make limited reference to visual impacts and there is no requirement to outline mitigation for visual matters in the process of registering an aggregate extraction site with Alberta Environment & Parks.

Visual Impact Assessment

At the development permit application stage, aggregate operators may be required to provide the municipality with a Visual Impact Assessment (VIA) to

establish benchmark conditions within the area proposed for aggregate operations and determine the anticipated visual impacts to adjacent public road frontages and/or adjacent dwellings. By using the assistance of a landscape architect, private and public viewpoints can be evaluated, and the significance of the visual effect can be established based on surveys, computer models and photo montages. Visual concerns associated with pit operations typically include the visibility of open excavations or machinery from neighbouring land uses or public roadways. The VIA should establish appropriate recommendations designed to mitigate potential unsightly conditions resulting from proposed aggregate operations.

Methods to reduce the visual impact of aggregate operations include:

- Planning appropriate landscaping and berming at the perimeter of the property along pubic road frontages;
- Complete ongoing reclamation once the phase of extraction has been depleted; and
- Place equipment on the pit floor so that operations can remain out of view of main roads or neighbouring residences.

Landscaping Plan and Landscape Management Plan

In most cases, the mitigation of potential unsightly conditions within an aggregate operation is addressed through the placement of earth berms and landscaping. It is common practice for overburden to be stripped from an aggregate site prior to extraction/processing activities. This overburden material is ideally suited to construct landscaped screening berms at the perimeter of the site along public road frontages.

At the development permit application stage, aggregate operators may be required to provide the municipality with a Landscaping Plan and Landscape Management Plan. These assessments will firstly identify the potential impacts upon the local landscape and nearby land users, and secondly, will provide a comprehensive strategy to mitigate these impacts to an acceptable level. It is equally imperative that the aggregate operator establish a plan to maintain the landscaped areas given that a supply of potable water is not typically available to irrigate the vegetation. As such, techniques should be employed to design the landscape screening features to be drought resistant and consider irrigation via low impact design techniques related to stormwater management. The landscape management should also include strategies to prevent the spread of weeds.

4.3.5 SURFACE DRAINAGE AND GROUNDWATER MANAGEMENT

Aggregate extraction/processing activities may involve disturbance to surface and groundwater. Although ground and surface water quality and flow planning considerations are largely regulated at provincial level through the Code of

Practice and pit registration process, municipalities can still play an important role to ensure these considerations are appropriately addressed and mitigated to avoid or reduce possible effects upon adjacent landowners and/or the local environment.

Most aggregate extraction operations are undertaken above the water table, and consequently, there may not be a need to monitor ground water flows. In certain cases; however, extraction must be undertaken below the water table (i.e. wet pit extraction) and in these instances the municipality may wish to impose more rigorous requirements upon the aggregate operator, both at the development permit application stage and throughout the lifespan of the pit's mining horizon.

Master Drainage Plan and Site-Specific Stormwater Management Plan

At the development permit application stage, aggregate operators may be required to provide the municipality with a Master Drainage Plan to evaluate the potential impacts an operation might have on regional drainage courses within the context of the larger watershed surrounding the site. Similarly, the municipality could require a Site-Specific Stormwater Management Plan to have the aggregate operator qualify the specific techniques to be used within the pit to responsibly manage surface drainage so as not to negatively impact positive surface drainage conditions situated up or downstream of the proposed operation.

Hydrogeological Impact Assessment

In circumstances where aggregate mining activities are expected to encounter the local near surface water table, aggregate operators may be required to provide the municipality with a Hydrogeological Impact Assessment at the development permit stage. The purpose of this assessment is to examine local groundwater conditions within the geological formation underlying the proposed aggregate operations and to determine the likelihood of potential interference with existing groundwater wells servicing dwellings, agricultural and/or business developments within the surrounding areas. This assessment is typically a requirement of the Province via the Code of Practice application and license registration process. As part of the preparation of this assessment, aggregate operators should be required to install monitoring wells within and adjacent to the proposed pit to establish a benchmark of existing local groundwater conditions.

Groundwater Monitoring

As part of the Code of Practice approval process, aggregate operators are required to provide the Province with regular reporting regarding the status of local groundwater conditions relative to their ongoing operations. As such, the municipality may require the operator to provide copies of this ongoing reporting to monitor the potential effects that the aggregate operation might have on the

local water table. It is noted that the Province has jurisdiction to enforce against any circumstances where groundwater quantity and/or quality is impacted as a result of an aggregate operation.

4.3.6 PROGRESSIVE RECLAMATION

As part of the Code of Practice registration process, Alberta Environment & Parks requires aggregate operators to provide financial securities to ensure that depleted pits are reclaimed in accordance with a pre-determined Reclamation Plan. An aggregate site can be returned to the same land use and capability that existed prior to the gravel operation. Alternatively, the site could be reclaimed to support a new and different land use that might be compatible with the local area. The issue of determining an appropriate reclamation plan and final land use for aggregate sites at the initial planning stages is often challenging, as these sites can operate over many years. Although sites developed in more remote areas are likely to be returned to a natural state or agricultural use, some situated in vicinity of more concentrated population areas could experience surrounding growth which changes the after use desired, and therefore, also the landform required. Nevertheless, it is important that reclaimed aggregate sites are returned to a condition that is suitable for their intended end use to avoid the need for further landscaping works and associated disruption to local communities. This can mean returning a site to a developable state rather than a natural state as extraction progresses to avoid future costs being incurred for fill and grading works.

While it is the responsibility of Alberta Environment & Parks to address the reclamation requirements of an approved aggregate operation, municipalities can still play a role to ensure operators address reclamation considerations. For example, municipalities could limit the area under open excavation at any given time and require the operator to implement progressive reclamation activities once the excavated area has become depleted. In this fashion, the potential for impacts arising from dust and/or unsightly conditions could be mitigated.

4.3.7 COMMUNITY CONSULTATION

Community consultation should be an important part of aggregate planning processes. Even with high quality operations, best management practices and monitoring, an aggregate extraction operation might still have remaining impacts on nearby properties. Good working relationships with neighbours and local communities will help aggregate operators to identify the most appropriate operating methods, ongoing mitigation strategies, and local benefits.

Better public understanding of aggregate extraction activities could be achieved by aggregate operators committing to an inclusive and transparent stakeholder engagement process which, ideally, could lead to an improved understanding and appreciation of proposed aggregate operations and better outcomes for the pit operator and adjacent landowners over the lifespan of mining/processing operations.

The aim of community consultation is to initiate good neighbour relationships which can work to:

- Educate stakeholders regarding the differences and overlap between provincial and municipal approval authority relative to aggregate operations;
- Identify potential concerns that can be addressed at the land use amendment and/or development permit stage;
- Identify best management practices and performance standards that can be used during site operations to reasonably mitigate expressed concerns;
- Identify long-term community features such as pathways, stormwater facilities, recreation areas or other amenities that could be built into the operations or reclamation plan for the extraction site;
- Establish opportunities for community benefits; and
- Create an open line of communication between aggregate operators and the local neighbours.

4.3.8 OPERATOR'S COMMITMENTS

As guided by an effectively designed and implemented stakeholder engagement process, expressed community concerns can be articulated and the operator can design the proposed aggregate operation in accordance with the appropriate performance standards which can best mitigate the stakeholder's concerns during the life span of the pit operation. Prior to, or as part of, a development permit application, an aggregate proponent can establish a comprehensive list of 'operator's commitments' to provide assurances to the interested stakeholder group that the pit will be operated responsibly. The municipality could then ensure appropriate conditions are put in place at the development permit stage in order to ensure the operator honors these commitments. This process could be an effective way to regulate matters such as hauling routes, hours of operation, and even the features surrounding the pit such as trees and berms to control noise pollution and air quality. It is even possible to work the ASGA Truck Registry into these conditions, ensuring that all trucks hauling in the area are operating as per ASGA Registry Standards.

4.3.9 GOOD NEIGHBOUR AGREEMENTS

In some instances, aggregate operators and communities may want to negotiate and agree to specific operating principles that can be recorded and agreed to in accordance with 'Good Neighbour Agreements'. Such agreements are usually simple documents that outline the general nature of the principles, objectives and expectations that are required to maintain a good relationship. For example, a Good Neighbour Agreement could articulate common expectations relative to matters such as:

- Setting specific truck access routes;

- Adhering to maximum noise levels;
- Setting hours of operations;
- Providing direct contact information for someone onsite;
- Conducting all communications in a respectful manner;
- Providing monitoring data online;
- Providing monitoring wells at off-site locations,
- Investing in wetland reclamations programs;
- Supporting stormwater management programs;
- Establishing expectations to contribute to community improvements, donations to specific community bodies or annual payments to support improvement projects or sponsorship of local community groups; and
- Establishing complaints management protocols and procedures.

The Good Neighbour Agreements are not intended to be 'legally binding' but instead meant to articulate 'matters of good faith' that have been negotiated between aggregate operators and stakeholder interests, which could then be translated by the municipality into development permit conditions as appropriate.

4.3.10 ONGOING MONITORING & EVALUATION

As described in the previous sections, implementation of performance standards could enable municipalities to better measure and assess the potential impacts of aggregate operations, and to provide for an ongoing monitoring process that is intended to more or less 'self-regulate' the relationships between aggregate operators and adjacent stakeholder interests throughout the lifespan of the pit's mining horizon. Performance monitoring will be required to identify and quantify the level of success associated with different operating practices and mitigation techniques. This knowledge can be transferred to the evaluation of new and renewed development permit applications.

4.3.11 DEVELOPMENT PERMIT RENEWAL INTERVALS

Development permits for aggregate operations are usually approved on a temporary basis for a period of up to five (5) years. Towards the end of the temporary period allowed by the permit, the aggregate operator may seek to renew the permit for the aggregate extraction to continue. Temporary planning permits allow municipalities to assess the impacts of the ongoing development and progression with extraction and reclamation in accordance with established performance standards before considering any potential approval conditions for development permit renewal (which may be required to address poor past performance over the previous 5 years).

4.3.12 COMMUNITY BENEFITS

Opportunity for municipalities to collect a Community Aggregate Payment Levy (CAP) was established in 2006 under Municipal Government Act (MGA) for the purpose of collecting funds from aggregation operators for the municipality to deploy as it sees fit. The maximum fee that can be sought under current Provincial enabling legislation is $0.40 for each tonne of aggregate produced. In the past, Sturgeon County has directed these funds to support local amenities such as community halls and outdoor recreation facilities.

In addition, at the time a municipality approves a subdivision and/or development permit in support of an aggregate operation. it may also seek financial contributions or off-site levies. Funds collected in accordance with a Transportation Off-site Levy must be used for the purpose of improving municipal roads that are impacted by aggregate operations. In contrast to the CAP Levy, this levy is a one-off payment and is payable at the subdivision and/or development permit stage before construction begins.

SECTION 5.0: CONCLUSION

This report is designed to support Sturgeon County's regulatory review process of its existing adopted policy and land use prescriptions relative to the regulation of aggregate resources. It highlights a summary of Best Management Practices (BMPs) that the County could adopt to facilitate more responsible extraction of aggregate resources and proposes various strategies, and evaluation metrics designed to mitigate the potential negative impacts between aggregate operations and adjacent landowners, without requiring the significant minimum development setbacks currently prescribed by the County's Land Use Bylaw.

The BMPs described in this report are based on an approach that considers science-based evaluation metrics that can be specifically measured, verified and monitored on ongoing basis to mitigate potential negative impacts between aggregate operations and surrounding landowners. The BMPs summary is intended to provide the basis for potential revisions to the County's existing regulatory framework

It is noted that adoption of the referenced BMPs within the Land Use Bylaw and other statutory plans could support Sturgeon County's strategic intention to consider expanded aggregate extraction activities in a manner that respects the needs of local stakeholders in balance with the long-term sustainability objectives of the municipality and Region.

APPENDIX I: INTERVIEW SUMMARY

In support of this report, Sturgeon County administration polled a variety of municipal jurisdictions (within and outside the Edmonton Metropolitan Region) relative to various considerations relative to the management of aggregate development. A total of nine (9) municipalities responded to a brief survey with verbatim transcript of responses included on the following pages.

In general terms, most respondent municipalities acknowledged that, although not all actively track the supply of aggregate resources locally, each have a sense that demand appears to be increasing. As such, most municipalities are experiencing considerable controversy implementing various processes to regulate aggregate activities due to tensions that often arise between aggregate and non-aggregate developments.

Most municipalities indicated that issues raised in response to aggregate proposals typically include concerns relative to noise, dust, traffic safety, visual impacts, groundwater, environmental, health and loss of property value. Most municipalities regulate aggregate developments principally via road use agreements with a reliance upon Alberta Environment and Parks to regulate matters such as dust, groundwater and reclamation activities via the *Code of Practice for Pits.*

Although most jurisdictions acknowledged the potential benefits that could be gained by early stakeholder consultation, there isn't a clear trend for municipalities to specifically mandate aggregate operators engage prior to submitting development proposals. While many municipalities assign minimum development setbacks between aggregate operations and adjacent dwellings, most did not distinguish between single residential vs. multi-lot subdivision scenarios.

Most municipalities do not have dedicated staff to actively manage aggregate operations once approved; however, most jurisdictions acknowledged the need for policy and process improvements to more effectively manage this form of development.

Survey Questions

1) Please describe the resources present in your County.

a. Sand vs. gravel vs. silica?

Sand and gravel only (Lacombe County)

Primarily river valley gravel (Leduc County)

The majority of our resource extraction is gravel will some sand. I don't believe we have any silica. (Yellowhead County)

Sand and gravel (Lethbridge County)

My understanding is that we have sand and gravel resources within our municipality. (Strathcona County)

They are predominantly sand and gravel. (Parkland County)

Currently Sand and gravel. (Thorhild County).

The bulk of the extraction activities are gravel with some sand, but no silica. (Rocky View County)

Sand, gravel, clay, peat, timber, oil, natural gas, limestone, shale, and coal. (Lac La Biche County)

2) Do you proactively map out existing resources in your Municipality?

No (Lacombe County)

Yes (Leduc County)

No. The County contracts our gravel requests to the various operators in the area. The operators would be responsible for mapping out existing resources. (Yellowhead County)

No (Lethbridge County)

No we do not. (Strathcona County)

The County maps the location of existing sand and gravel pits and approved haul roads on our GIS system. These are operations that have current development permits. Potential (future) pits are not identified on our system. (Parkland County)

We have mapping and GIS which shows where these resources are located. (Thorhild County).

We do not have a separate mapping layer for sand and gravel operations. All operations are by roll number and no way to really search for only extraction activities. (Rocky View County)

3) Do you have a clear sense of local current and future demand for aggregate?

High demand (Lacombe County)

For the municipality yes. The Sand and Gravel Association should have provincial date. It is hard to separate the County from the Capital region. (Leduc County)

No (Yellowhead County)

Lethbridge County knows what it needs in terms of resources, but we do not know what other demand would be in the region. (Lethbridge County)

The demand is hard to gauge if there are infrastructure or heavy industrial use development occurring, we notice that the demand does increase. (Strathcona County)

Generally, many areas along North Saskatchewan River are known to have sand and gravel deposits. Beyond that, generally the industry takes initiatives in scoping out potential deposit areas. (Parkland County)

Yes (Thorhild County).

Things are changing but there seems to be a sense of understanding on aggregate demand. (Rocky View County)

4) Is resource extraction typically a controversial?

Yes (Lacombe County)

Yes, very controversial. The County did an Area Structure plan for the Genesee area a few years ago because of the controversy (proactive). The plan was supposed to address residents concerns and make it easier to approve pits. However, the document did not contain concrete solutions to the issues. We were supposed to implement a phasing strategy but haven't to date. We recently approved two new pits in this area. (Leduc County)

Yes (Yellowhead County)

Yes (Strathcona County)

Yes, very controversial in specific areas, especially in close proximity to existing named subdivisions and in high valued environmentally sensitive areas (i.e. North Saskatchewan River). (Parkland County)

Yes, particularly in the Long Lake area. (Thorhild County).

Extremely controversial. (Rocky View County)

No issues (Lac La Biche County)

a. What are the most common issues/concerns heard during application processes?

We are fortunate that proactive community planning has placed our residential areas away from our aggregate resource areas, alleviating a lot of controversy. Primarily this is due to most of our aggregate being in an esker formation west of Lacombe, with only some aggregate located along our rivers where we may have more residences. Most of our common issues arise from landowners and operators who lease, not seeing eye to eye. There is the occasional pit that we hear concern about noise, dust, health impacts, but those issues are typically easy to address with conditions of approval or educating the complainant. Sand and gravel pits are only a discretionary use in the Agricultural District and not listed in any other district. This also alleviates some issues that are common in other municipalities where they are listed in multiple districts that may be conflicting. (Lacombe County)

Proximity and impacts of resource extraction to existing residences (Yellowhead County)

Concerns come up when a new or expanding operation is near existing residential development, concerns are dust, traffic, noise, environmental impacts. (Lethbridge County)

Traffic volume, traffic safety concerns, noise, dust, potential impacts to water wells, property devalue and health. (Strathcona County)

Traffic and traffic safety on local roads – especially when near named multi-parcel subdivisions, impacts on roads (road deterioration), Nuisance impacts (typically noise, dust) – especially near named subdivisions, Perceived impacts on property values of nearby properties and subdivisions, Environmental impacts – when near, adjacent to, or in classified Environmentally Sensitive Areas. This can broadly encompass surface / groundwater impacts, biodiversity, air quality, etc. (Parkland County)

Concerns over lake quality, noise problems, aesthetics, impacts to wildlife, impacts to road, dust control, etc. (Thorhild County).

We receive the common complaints/issues: dust/air quality, truck traffic, noise and basically 'not in my backyard' visual concerns. (Rocky View County)

5) Is public engagement clearly outlined in the application process? Please explain.

Yes. All sand and gravel pits require pre-circulation to landowners within 1 mile of the pit, and ½ mile of an unpaved haul route (we do not circulate along paved haul routes). This process is outlined in our *Notice and Pre-circulation Guide* (Lacombe County)

Yes, the applicants held open houses to describe the project. Pits are approved by Council using the regular channels and public notification. (Leduc County)

If the applications meets all the development setbacks and other requirements of the LUB, the permit would be issued and as the approval is discretionary,

notices are sent to the adjacent landowners. If the operator is requesting a variance to the setback, consent must be provided by the adjacent residences. If no consent is provided the County will not approve the application. (Yellowhead County)

The Lethbridge County Land Use Bylaw (LUB) outlines who is required to be consulted. (Lethbridge County)

As aggregate extraction is considered a discretionary use, we typically pre-circulate to adjacent property owners. However, we do encourage the operator to conduct some form of open house or introduce the project to adjacent property owners – but this is not a mandatory requirement. (Strathcona County)

Requirements are outlined in the County's Land Use Bylaw under Section 12.12. Additional considerations are also outlined in Council Policy C-AD51 Public Engagement. Generally, the applicant is responsible for arranging pre-application notifications and the open house. The engagement must be completed, and the outcomes of the engagement summarized and presented to the County as part of the development permit application. (Parkland County)

If the project is to be located within 800m of Long Lake, yes. Other projects – no. (Thorhild County).

6) Are good neighbour agreements common in your municipality?

We have a lot of adjacent pits. In those cases, it is common for good neighbour relations so that they can both extract up to the property line. (Lacombe County)

No, I am not familiar with them. (Leduc County)

Not aware of such an agreement. Could you please provide me with an example? (Yellowhead County)

No (Lethbridge County)

No (Strathcona County)

If by this you are referring to agreements between gravel pit operator and neighbouring subdivisions, some of the larger operators do have existing relations with the affected subdivisions - including pledges to invest in community services / facilities, etc. (Parkland County)

Not sure what you mean. (Thorhild County).

No (Rocky View County)

7) While setbacks are often used to manage potential impacts from operations, performance standards can be an even more effective tool to manage pits. Does your municipality set performance standards? Please describe.

The major impacts are road damage, dust, vehicle traffic and noise. These impacts are managed through road use agreements with public works. (Leduc County)

Similar to question 10 answer below, most of our standard conditions of approval or Development Agreement and Sand/Gravel Haul Agreement would address these items. (Lacombe County)

No, we do not have any performance standards. Once again curious as to the purpose of such an agreement. (Yellowhead County)

No, we do not have any additional performance standards. (Lethbridge County)

No (Strathcona County)

No, the operators are expected to adhere to all requirements under their AEP Code of Practice approval for any operational activities within the boundary of the pits. (Parkland County)

Not sure what you mean by performance standards. We do have a list of requirements, but again, I'm not sure what you mean by performance standards. (Thorhild County).

No performance standards to my knowledge. Operators are currently held to their Master Site Development Plan, which are approved by Council and they are created in reference to the Land Use Bylaw and the County Plan. (Rocky View County)

8) Do you employ municipal staff to actively monitor and manage operations to ensure compliance? Please describe.

Our Senior Planner deals with most gravel pit files. Compliance is mostly dealt with on a complaint basis. Our sand and gravel pit approvals are also max 5-year terms, and when they are renewed, we can deal with compliance issues. (Lacombe County)

Not directly. We do enforce road use agreements though. (Leduc County)

No (Yellowhead County)

The development authority will monitor operations that do not required provincial approval (Lethbridge County)

No, however we will follow-up if we receive a complaint. (Strathcona County)

Planning and Development Services handles all development related enforcement on a complaint-by-complaint basis. The Supervisor of Development Planning Unit has CPO level 1 designation to this end. Enforcement Services has a Bylaw Enforcement Officer dedicated to gravel related complaints and enforcement. This Bylaw officer works closely with Supervisor, Development Planning Unit. (Parkland County)

We do have enforcement staff to ensure they are following the DP and RUA. (Thorhild County).

We have some dedicated staff to manage the County owned pits but not to actively manage private pits. RVC enforcement is complaint driven and thus only responds to complaints from either internal or the general public. (Rocky View County)

9) Do you have different regulations in proximity to single lot subdivisions vs. multi-lot subdivisions?

No, this would be dealt with on a case by case basis based on the pit proximity to a large subdivision, if concerns were raised during pre-circulation the conditions of approval might reflect this. (Lacombe County)

No, fortunately, there are no multi parcel subdivisions in this area. Dwellings are spread throughout the area. (Leduc County)

No, we currently only have regulations for proximity to a residence. (Yellowhead County)

There is a greater setback to multi-lot residential as noted in the LUB. (Lethbridge County)

No (Strathcona County)

Section 12.12 of the LUB sets out the expectations for development of future natural resource extraction by setting regulations for noise, dust, hours of operations etc. These regulations apply regardless of proximity to single or multi-lot subdivisions. The LUB however sets an additional requirement that processing operations cannot be closer than 300 m from a multi-lot subdivision. (Parkland County)

No, but the regulations are different in the Long Lake area where we have multi-lot subdivisions. (Thorhild County)

Not to my knowledge. All follow the basic requirement for extraction to first re-designate/zone the land use for the area to Natural Resources Extraction (this involves heavy public engagement and opportunities for voicing concerns). Once that re-designation is complete, the operator must prepare a Master Site Development Plan (MSDP). This will contain all the information on the items listed in question 10. All environmental concerns are addressed in this document. (Rocky View County)

10) Do you have policies or best practices in place to monitor _____ caused by operators? Please describe.

a. Cumulative impacts

We rely on the combination of County enforcement and operator compliance with Alberta Environment and Parks approval to cover cumulative impacts. (Parkland County)

b. Traffic

Regulated by hours of operation (Yellowhead County)

Covered under our LUB Section 12.12 (Parkland County)

c. Noise

Restrictions to hours of operation (Yellowhead County)

Covered under our LUB Section 12.12 and the County's Community Standards Bylaw related to noise levels. (Parkland County)

d. Setbacks

Yes, development setbacks (Yellowhead County)

Covered under our LUB Section 12.12. (Parkland County)

e. Air quality

Yes, dust control within pit and on haul routes. (Yellowhead County)

Operators must comply with the provincial Environmental Protection and Enhancement Act regarding air quality, which is also noted in their approved development permit. (Parkland County)

f. Visual impact

Setbacks (Yellowhead County)

Covered under our LUB Section 12.12. (Parkland County)

g. Surface drainage and groundwater management

Provincially regulated (Yellowhead County)

Operators must comply with Alberta Environment and Parks Code of Practice approval that covers hydrological impacts. (Parkland County)

h. Reclamation

Provincially regulated (Yellowhead County)

Operators must comply with Alberta Environment and Parks Code of Practice approval related to reclamation. (Parkland County)

Most of our standard conditions of approval address these items. We do require a Progressive Reclamation Plan for every pit, regardless of size. A Development Agreement and Sand/Gravel Haul Agreement are also required for every pit. (Lacombe County)

Road impacts are managed with best practices via road use agreements. The province is responsible for managing other impacts. (Leduc County)

The information we have is contained with the LUB, there are no additional policies or best practices. (Lethbridge County)

Our RUA agreements cover the traffic, noise and hours of operation. (Thorhild County).

Prior to my commencement at Rocky View, there was an effort to adopt some standards/practices to deal specifically with extraction activities, it was called Aggregate Resource Plan This was initiated due to concerns over resource extraction development policies and lack thereof at the County and to provide performance standards and policies for future extraction. A clear set of guidelines and direction is what was sought after, mostly addressing the items you have outlined below. It received enormous backlash/concerns from the public and was not passed/adopted by Council. (Rocky View County)

11) How often do you update your existing bylaws? Can you speak to process and how it was received by the public?

Our MDP and LUB are evaluated annually, by way of a review matrix. This gives us a 'report card' on how we are doing in terms of policy. The pubic are welcome to submit letters to Council with requests for changes or concerns they may have with the policies. These letters are integrated into the annual review, and Council considers them. We also do a full review every 10 years including significant public consultation. During our 2017 review, the public was able to go through our public consultation process and see how their input created and formed the policies. We are very proud of this public consultation process that we designed and completed in house, without the use of consultants. In 2018, the Alberta Professional Planners Institute and the Minister's Awards recognized our project for the public participation process designed. The 2017 review did not bring any huge changes to sand or gravel pits though. (Lacombe County)

Current policy has not been updated since 2008 when the LUB was approved by Council. However, staff is currently reviewing the policy. (Leduc County)

The last LUB was adopted in 2013. In 2020/21 we will be reaching out to the residence adjacent to these pits as well as the operators to review our existing policies. (Yellowhead County)

The LUB was updated in 2013 which included amendments to the requirements for resource extraction. There was little to no feedback regarding resource extraction from the public at that time. (Lethbridge County)

The last update to our Land Use Bylaw was in 2015 and we are currently undertaking a further refresh of this Bylaw. (Strathcona County)

Our Land Use Bylaw is updated on a regular basis, typically yearly, to address any identified gaps related to development permitting or enforcement. An amendment to LUB related to gravel extraction was presented several years ago but tabled indefinitely by Council due to its controversial nature. (Parkland County)

We should be updating our Land Use Bylaw in 2021, at which time we may be reviewing natural resource extraction regulations. Further, we have a resource extraction district applicable to the Long Lake area that we approved in 2018, which followed the approval of the Long Lake Area Structure Plan that same year. (Thorhild County)

Currently updating the Land Use Bylaw. The process follows the standard process that most Municipalities follow for Bylaw amendments. Seems to be well received by the public. (Rocky View County)

12) **Do you have any remaining thoughts on aggregate extraction in your municipality, the region or province?**

I don't believe we have the same number of gravel pits that other municipalities may have, but I believe we all face similar issues. We would also be happy to provide you with the outcomes of our review later this year. (Yellowhead County)

It would be most appreciated if you could send the section of your Municipal Bylaws and/or Plans that deal with Aggregate Extraction specifically. Thank you! (Lethbridge County)

Not at this time. It would be most appreciated if you could send the section of your Municipal Bylaws and/or Plans that deal with Aggregate Extraction specifically. Thank you! (Strathcona County)

Our LUB only allows gravel pit operation that are 5 ha or larger in mined area. Any pit smaller than 5 ha are neither permitted nor discretionary uses and cannot be allowed anywhere in the County. This is because pits smaller than 5 ha are not required to obtain AEP Code of Practice approval, and therefore are not regulated by AEP in terms of reclamation, etc. Hence our LUB prohibits them as the County does not want pits that are not covered by AEP Code of Practice. It would be most appreciated if you could send the section of your Municipal Bylaws and/or Plans that deal with Aggregate Extraction specifically. Thank you! (Parkland County)

Thorhild County has a lot of sand and gravel resource potential, but with it comes potential conflict with landowner interests. We need to improve on our regulations and permitting processes to help mitigate these conflicts. (Thorhild County)

Extraction activities are a necessity for many different types of projects and is a large portion of the economy—providing many jobs and such for people. I know that the province is contemplating further reducing AEP EPEA Sand and Gravel staff and have mentioned putting the responsibility for managing sand and gravel operations on private land, to the municipalities. Of major concern, to me, is to ensure that proper reclamation is done in a timely manner. Most operators, especially legacy files, there is no incentive for an operator to properly reclaim. They leave it for many years and they simply walk away

stating that it is too expensive to reclaim and cheaper to simply leave it. Adequate security needs to be held to provide incentive for operators to properly reclaim. The correct work needs to be done up-front. Proper and adequate pre-planning is required and sometimes lacking. There is no incentive or measures to force operators to follow their approvals and the operating guidelines/plans that they submit. There are many times when an operator goes outside their operating area, does not follow the mining sequence plan and or clears the entire site instead of simply a portion (for progressive reclamation reasons). The enforcement of these issues is long and drawn out and rarely dealt with—reasons for this is that AEP is understaffed and the enforcement branch 'triages' sand and gravel to low priority, unless there is a release to a river or something environmentally significant to deal with, and the sand and gravel 'bad operators' are never dealt with. Most Municipalities are either too small and do not have the proper staff, lack of understanding of some environmental guidelines and simply do not have the jurisdiction or political will power to deal with the issues. The lack of enforcement is viewed by the public as a negative and further creates resistance to any new operations being approved. General misconceptions and misinformation around extraction activities, in general, by the public. Poor quality of pre-planning and lack of adherence to said plans by the operators. It would be most appreciated if you could send the section of your Municipal Bylaws and/or Plans that deal with Aggregate Extraction specifically. Thank you! (Rocky View County)

APPENDIX 2: AGGREGATE OPERATION SETBACK SUMMARY

To support the summary of BMPs contained in this report, Sturgeon County administration also reviewed the Land Use / Zoning Bylaws of eleven (11) additional municipalities to draw comparisons among the management of aggregate extraction in municipalities in Alberta and in the Central Okanagan. The following provides a summary of the results of the interviews with municipalities and the information extracted from the Land Use / Zoning Bylaws of the municipalities.

Table 1: Jurisdictional Review of Aggregate Operations Setbacks: Summary

Notes for table interpretation:
(v) *indicates a setback can be varied.*
In most cases, dwelling setbacks are measured from the outer wall of a dwelling.

Municipality	***Setback to Property Line***	***Setback to Dwelling***	***Processing-Specific Setback***	***Multi-Lot Setback***
Leduc County	*6m*	*100 m*	*N/A*	No separate multi-lot setback
Strathcona County	NO minimum setbacks	*NO minimum setbacks*	*N/A*	No separate multi-lot setback
Lacombe County	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	No separate multi-lot setback
Parkland County	*NO minimum setbacks*	NO minimum setbacks	*300 m*	*300 m **(v)***
Camrose County	*3 m*	*N/A (3m, see left)*	*N/A*	*No separate multi-lot setback*
Thorhild County	NO minimum setbacks	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Lac La Biche County	NO minimum setbacks	*NO minimum setbacks*	*N/A*	*800 m (if on-site processing occurs for >2 weeks)*
Lac Ste. Anne County	*500 m*	*800 m*	*1,500 m*	*1,500 m **(v)***
Lamont County	*3 m*	*3 m*	*N/A*	*No separate multi-lot setback*
Westlock County	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Barrhead County	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	*305 m **(v)***
Foothills MD	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Red Deer County	*N/A*	*165 m **(v)***	*165 m*	*No separate multi-lot setback*
Rocky View County	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Lethbridge County	N/A	*300 m **(v)***	*300 m*	*400 m*
MD of Big Horn	*N/A*	*150 m*	*300 m **(v)***	*No separate multi-lot setback*
Yellowhead County	*N/A*	*400 m*	*750 m*	*No separate multi-lot setback*
Wetaskiwin County	*NO minimum setbacks*	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Wood Buffalo	*N/A*	*800 m*	*800 m*	*No separate multi-lot setback*
Regional District, Central Okanagan	NO minimum setbacks	*NO minimum setbacks*	*N/A*	*No separate multi-lot setback*
Sequenced Dataset	n = 4 3, 3, 6, 800	***n = 9*** 3, 3, 100, 150, 165, 300, 400, 800, 800 Mean = 302.33, Median = 165	***n = 7*** ***165, 300, 300 300, 500, 750, 800*** Mean – 445, Median – 300	***n = 5*** 300, 305, 400, 800, 1500 Mean = 661, Median = 400

Table 2: Assessing the Jurisdictional Review of Aggregate Setbacks – Key Points
How many municipalities have *no setbacks* to begin with (in all cases)? 8 of 20 **(40%)** of municipalities examined have *no setbacks* outlined at all (whether for extraction, processing, or multi-lot subdivisions), and setbacks are determined on a case-by-case basis.
How many municipalities have *no setbacks* for *some or all* situations (and defined setbacks in others)? 11 of 20 **(55%)** of municipalities examined have *some or all scenarios* where setbacks are not defined, rather determined on a case-by-case basis.
How many municipalities employ setbacks that can be varied? Of the 12 municipalities that do employ setbacks in some or all cases, 6 municipalities (or **50%**) allow for a variance of these prescribed setbacks if certain criteria are met and the Development Authority deems it suitable to allow the proposed variance.
How many municipalities have setbacks that are different for multi-lot and single-lot subdivisions? **75%** (or 15 of 20) municipalities *do not* employ separate setbacks for multi-lot versus single-lot subdivisions. 25% of the municipalities examined (5) do employ this approach.
How many municipalities have setbacks for different types of uses (i.e. extraction vs. processing)? From the 20 municipalities examined, 12 use prescribed setbacks. Of the 12 utilizing prescribed setbacks, 7 (or **58%**) employ separate setbacks for extraction-only, versus activities involving processing (i.e. crushing, washing, etc.).

Of the municipalities that employ prescribed setbacks, what is the "average" setback from a property line or dwelling?

Because of the intricacies and details involved in regulating aggregate (setbacks can be applied with different criteria, and in conjunction with other regulations), it is difficult to accurately name an "average" setback. Most municipalities regulate setbacks, if applicable, with a setback to the dwelling (versus the property line), making this the most applicable statistic. The average (mean) setback from a dwelling is **302.5m**, while the median is **165m**. The range of setbacks from a property line or dwelling varies from 3.0m, to 800.0m. The sequenced dataset is shown below, depicting the numbers from the dataset analyzed.

Ranking (low to high)							📍		
Sequenced dataset	3	3	100	150	165	300	400	800	800

Pin icon indicates current Sturgeon County regulation compared to the dataset. Green = low data, yellow = middle data, red = high data.

Of the municipalities that employ separate setbacks for multi-lot subdivisions, what is the "average" setback from a multi-lot subdivision?

Once again, because of the intricacies and details involved in regulating aggregate (setbacks can be applied with different criteria, and in conjunction with other regulations) , it is difficult to accurately name an "average" setback for multi-lot subdivisions. However, simplifying the data shows that of the five municipalities employing separate setbacks for multi-lot subdivisions, the average (mean) setback is **661m** and the median is **400m.**

Ranking (low to high)				📍	
Sequenced dataset	300	305	400	800	1500

Pin icon indicates current Sturgeon County regulation compared to the dataset. Green = low data, yellow = middle data, red = high data.

Of the municipalities that employ prescribed setbacks and have setbacks for processing activities such as washing, crushing etc., what is the "average" setback for such activities?

Seven municipalities have separate setbacks outlined for processing activities, and amongst these municipalities the average (mean) setback for processing is **445m**, while the median is **300m**.

Ranking (low to high)							
Sequenced dataset	165	300	300	300	500	750	800

Pin icon indicates current Sturgeon County regulation compared to the dataset. Green = low data, yellow = middle data, red = high data.

Table 3: Jurisdictional Review of Aggregate Setbacks & Regulations	
Municipality	**Summary of Setbacks & Regulations**
Leduc County	• 100m setback applies between existing dwellings and proposed resource extraction developments. • 6m setback applies from the property line (where no dwelling setback applies). • There are no separate regulations for processing operations vs. extraction-only operations.
Strathcona County	• Strathcona County does not have minimum setbacks for any type of standard operations (extraction, processing, or multi-lot subdivisions). • Only one setback is prescribed, in a very unique scenario: an 800m setback applies to the environmentally sensitive area of Trappers Lake. • Permits for resource extraction are granted for ten years before requiring renewal. • Where the province does not take securities for reclamation, the municipality requires them.
Lacombe County	• Lacombe County does not have minimum setbacks for any type of standard operations. • The County does require a community consultation plan be submitted and approved by the operator
Parkland County	• Parkland County does not have a minimum setback for extraction in general. • A 300m setback applies to a multi-lot subdivision, but this setback can be varied if no processing occurs within the variance area and minimum criteria are adhered to. • A 300m setback that cannot be varied applies for processing activities.
Camrose County	• No minimum setbacks apply beyond the 3m setbacks prescribed from property lines. • Where the province does not take securities for reclamation, the municipality requires them.
Thorhild County	• Thorhild County does not have minimum setbacks for any type of standard operations. • Where the province does not take securities for reclamation, the municipality requires them.
Lac La Biche County	• Lac La Biche County has an 800 m setback to multi-lot subdivisions that applies *only if* crushing is taking place for a time period of 2 weeks or more. • If crushing is not to occur for more than two weeks, then no minimum setback to multi-lot subdivisions (or other setbacks) is in place.
Lac Ste. Anne County	• 1,500 m setback from multi-lot subdivisions that can be varied by the development authority

Lamont County	• The minimum setback for aggregate resource extraction is 3m in Lamont County. • Where the province does not take securities for reclamation, the municipality requires them. • While setbacks do not exist for processing (i.e. crushing) there are specific regulations surrounding crushing – for example, the crusher must be located at the bottom of the pit to reduce noise impacts. • Permits for resource extraction are granted for nine years before requiring renewal. • New proposed subdivisions in proximity to resource extraction deposits are discouraged in order to support sustainable extraction of resources.
Westlock County	• There are no minimum setbacks restricting aggregate resource development. • Where the province does not take securities for reclamation, the municipality requires them. • Proposed subdivisions and development in proximity to resource extraction deposits are discouraged through municipal policy in order to support sustainable extraction of resources. • Minimum setbacks related to resource extraction do exist; however, these setbacks are imposed on proposed residential development, not the aggregate development. In Westlock County, a buffer of 1.6km is placed around existing operations that prevents new residential development.
Barrhead County	• No minimum setbacks exist for all dwellings or parcels. • A minimum setback of 305 m exists for multi-lot subdivisions. • The 305 m setback for multi-lot subdivisions can be varied, provided no processing (crushing, washing) occurs in the variance area. • Where the province does not take securities for reclamation, the municipality requires them. • Proposed subdivisions or developments in proximity to resource extraction deposits are not supported if they will later result in development restrictions of aggregate operations, in order to encourage the sustainable extraction of resources.
MD of Foothills	• No minimum setbacks exist.
Red Deer County	• Setbacks in Red Deer County are 165 m. • The 165 m setback is variable for extraction activities where parties agree to the variance. • The 165 m setback is *not* variable for processing activities. • Hours of operation vary with setbacks adhered to.
Rocky View County	• No minimum setbacks exist.

	• Proposed subdivisions and development in proximity to resource extraction deposits are discouraged in order to support sustainable extraction of resources.
Lethbridge County	• A 300 m setback to a residential dwelling applies for extraction – this setback *can* be varied if there is no processing. • A 400 m setback to multi-lot residential area boundaries applies – this setback cannot be varied. • A 300 m setback to any residential dwelling applies where processing activities are occurring. • New dwellings proposed in the RA (Rural Agricultural) area are tied to these setbacks reciprocally, and the re-designation of land to a multi-residential zone is not allowed within 400m of an existing or proposed resource extraction operation.
MD of Big Horn	• A 150 m setback applies between any dwelling and any extraction activity. • A 300 m setback applies between processing activities and any dwelling or extraction activity; this setback *is variable* at the discretion of the development authority. • Permits for resource extraction are granted for nine years before requiring renewal. • Where the province does not require a reclamation plan and take securities for reclamation, the municipality requires them.
Yellowhead County	• A 450 m setback applies between all dwellings and extraction uses. • A 750 m setback applies between all dwellings and aggregate processing uses. • The above setbacks do not apply to resource extraction uses and residences separated by a divided highway.
Wetaskiwin County	• No minimum setbacks exist.
RM Wood Buffalo	• A universal, 800m setback applies.
Regional District of Central Okanogan	• No minimum setbacks exist.