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The purpose of this intentions paper (IP) is to consult on the ministry's proposed changes to the Agricultural Waste Control Regulation (AWCR) in response to the recommendations in the POLIS¹ Hullcar Review Recommendations Report (POLIS Report). This IP combines the results from two previous policy intentions paper consultations (January 2012 and July 2015) and a final policy document resulting from the agriculture industry working group (AgWG) consultations.

Many of the POLIS Report's recommendations have already been contemplated and addressed in the previous proposed requirements. New proposed policies resulting from the POLIS Report recommendations, that may be applicable to other areas of the province, as well as the Hullcar Valley, are highlighted in this IP. While many of the POLIS recommendations are for immediate actions, proposed changes to the AWCR are intended to prevent future issues.

POLIS Hullcar Review (excerpt)

"In recent years, the Hullcar Valley has become a focal point for issues related to agriculture and drinking water quality. Since 2014, nitrate levels in the Hullcar Aquifer (No. 103) have not consistently met the Canadian Drinking Water Standards, leaving local residents on a persistent Water Quality Advisory. Evidence suggests that farm-based activities overlaying the aquifer are significantly contributing to the nitrate pollution that is compromising the local drinking water. Although farm practices have improved more recently, it is still uncertain if existing changes to nutrient application and management practices are sufficient to ensure source water protection in the future. Historical activities have resulted in a legacy of nitrates in the soil and aquifer, and the potential for current agricultural practices to contribute to future elevated nitrate levels warrants a precautionary approach to ongoing nutrient application activities. However, further proactive steps both locally and within the overall Provincial source water protection regime will be needed to help reduce future problems and accelerate rehabilitation of the Hullcar aquifer as a safe drinking water source. ...This report lays out nine recommendation areas in a Solutions Framework for the Minister of Environment and Climate Change Strategy (and the whole of the provincial government) to consider in the context of the Hullcar Valley, and— importantly—in source water protection more broadly in B.C."

Goals

The goals for updating the AWCR and associated guidance have not changed and are to:

- Enhance and Improve water and air quality by requiring that good, environmentally protective agricultural practices are followed.
- Ensure watercourses and groundwater are protected through proper storage and use of manure, other nutrient sources and agricultural materials.
- Provide certainty—through clear, unambiguous requirements—focused on desired environmental outcomes.
- Update guidance to facilitate appropriate and beneficial use of manure and other agricultural by-products.

¹ POLIS Project on Ecological Governance Recommendations Report "From Crisis to Solutions: Towards Better Source Water Protection and Nutrient Management in the Hullcar Valley"

Environmental concerns

The AWCR describes practices for using, storing and managing agricultural waste in an environmentally sound manner and applies to all agricultural operations in the province. Good agricultural stewardship of the land base in B.C. supports environmentally protective values and should pose a low risk for adverse impacts to the environment. However, improper agricultural practices result in negative impacts to air, soil and water quality, as well as contribute to cumulative effects – from point and non-point sources.

Examples of negative impacts include:

- Excess nutrients (e.g., nitrogen, phosphorus) entering surface waters encourage algae growth – which depletes oxygen and contributes to eutrophication of water bodies – leading to fish and invertebrate die-off and human health concerns.
- Nitrates and pathogens entering drinking water sources (both surface water and groundwater sources) and posing risks to human health.
- Suspended solids and sediments entering surface water from soil erosion and runoff contributing to decreases in water quality.
- Emissions into the air from agricultural activities, such as ammonia and particulate matter from manure management activities, forced air ventilation systems and smoke from incinerators used on agricultural operations are of concern – particularly when emissions reach levels that impact respiratory health.

Key Policy Concepts

- ➔ Direct discharges to surface or groundwater prohibited.
- ➔ Regulatory requirements that lead to desired environmental outcomes.
- ➔ Risk-based approach - focused on a higher level of protection in higher risk areas, conditions and activities.
- ➔ Corrective actions incorporated.
- ➔ Encourage beneficial use of agricultural by-products (i.e., manure) and appropriate agricultural management practices.

Key policy concepts

Good agricultural practices reduce or eliminate these negative impacts, as well as benefit farmers and agricultural lands through efficient utilization of nutrients from manure and other materials. The proposed requirements include the following key policy concepts to address the concerns:

- Prohibit direct discharges (point sources, e.g., from pipes or spreading equipment) into surface water or groundwater.
- Address indirect discharges (non-point sources, e.g., contaminated runoff from fields that received manure application) causing negative or adverse effects in watercourses.
- Maintain emissions standards for biomass-fuelled boilers or heaters (added in 2008) and mortality incinerators.
- Achieve desired environmental outcomes through clear, unambiguous requirements.
- Use a risk-based approach that considers regional, geographic and climatic differences.
- Require a higher level of protective measures where there is a higher risk or potential for pollution.
- Incorporate corrective actions, and clear, compliance points.
- Encourage use of non-regulatory tools to facilitate good agricultural practices and the potential for beneficial use and appropriate management of manure and other agricultural byproducts.

Structure and content

1. General considerations

The proposed requirements will apply to all agricultural operations in the province – from small to large, hobby to commercial.

Requirements will be harmonized with existing related regulations, including the Organic Matter Recycling Regulation (OMRR), the newly enacted *Water Sustainability Act*, the *Farm Practices Protection Act* (FPPA), the *Public Health Act*, the *Forest & Range Practices Act*, the *Range Act*, and the *Land Act* – and their respective regulations, where they interact with agricultural activities.

The intent of the revisions is to not duplicate existing regulations. While good management practices may not be required under a regulation, they will assist in meeting policy objectives—for example, effective control of fugitive dust and odours (considered nuisance concerns)—will help reduce the attraction of wildlife and other vectors, addressing environmental concerns and environmental goals.

2. Updated definitions

Definitions in the revised regulation will be updated to clarify scope, intent, and enforceability of regulatory provisions. For example, specifically defining what a ‘fertilizer’ is and what a ‘soil conditioner’ is; and using the term “agricultural by-product” to include manure, composted materials, soiled bedding, post-mushroom substrate and digestates, etc., rather than “agricultural waste”.

3. Risk-based approach

A risk-based approach will be used that focuses on desired outcomes. Consideration of risk to the environment involves four factors:

- **Location** – e.g., vulnerable aquifers, sensitive receiving environments, wetlands.
- **Climate** – e.g., amount of seasonal or annual rainfall.
- **Weather conditions** – e.g., windy, freezing temperatures.
- **Farming operation or activity** – e.g., confined livestock feeding areas, size of operation, agricultural composting, management and land application of nutrients.

Every agricultural operator needs to identify and understand the environmental concerns for their operation and agricultural land-base, taking these four factors into account in their management decisions. Higher risk operations or activities, particularly in high risk areas or during high risk conditions, warrant specific protective measures. In certain circumstances, an equivalent level of protection to a minimum requirement may be considered.

High risk areas are areas where, due to permanent or usual geographic, topographic or climatic conditions, there is a high risk for adverse impact on the environment or human health, and include: a high precipitation area²; land over a vulnerable aquifer³; and regionally-defined sensitive receiving environments or areas, such as a phosphorus-sensitive area⁴;

High risk areas and conditions will be defined in the regulation – with a list included in a Schedule. An interactive map with high risk areas outlined on it is planned to be included in guidance materials.

² An area of the province that receives an average of 600 mm or more during the period beginning October 1 and ending on April 30 of the next year.

³ An area having one or more aquifers classified as highly or moderately vulnerable under the [British Columbia Aquifer Classification System](#).

⁴ A watercourse with high phosphorus loading, due to a high risk for impacts from runoff, and includes an area around the watercourse that contributes to the loading.

High risk conditions are conditions in which, due to temporary, intermittent or irregular topographic, climatic or other conditions, there is a high risk for adverse impact on the environment or human health; and include: strong, windy conditions that can pick up and move solids or particulate matter; storm events; the degree of field slope towards a watercourse; and intense or high rainfall periods.

A level of protection more stringent than the basic requirements will be required where there is a constant high risk, e.g., over a vulnerable aquifer, and when there is intermittent high risk, e.g., during a high rainfall event. For example, an agricultural operation located over a vulnerable aquifer will need to store manure and other nutrient sources on an impermeable⁵ surface.

Other protective measures include: covering temporary field storage from October 1 to April 1, no land application periods, and incorporating nutrient management planning. A higher level of protective measures may be specified on a periodic basis, for a certain period of time, or if a director has specific concerns, or there is a chronic problem with a particular location or situation. Protective measures for high risk areas and conditions that are specific to each topic are set out in the following topic sections.

4. Emissions

General Prohibition

- Agricultural operations will need to ensure that dust, feathers, and particulate matter from forced air ventilation systems used in the agricultural operation do not enter a watercourse, a domestic water source, or cross a property boundary.

Odours not prohibited

- Odours from agricultural operations or activities will not be restricted providing such operations or activities are carried out in accordance with requirements and meet standards. Odourous compounds that meet the definition of an air contaminant will be prohibited.
 - An odourous compound is considered an air contaminant under the *Environmental Management Act* (EMA) if the nature of the odour is such that it causes, or is substantially at risk of causing, damage to the environment, or injury, harm or material discomfort to the health or safety of a person.

5. Registration - Boilers and heaters

- Agricultural operations using a boiler or heater for agricultural purposes will continue to be required to be registered (section 4 of the Waste Discharge Regulation (WDR)).
 - An exemption for small boilers and heaters (0.15 MW or less) is newly proposed. This will be contingent on the boiler or heater being certified to meet the Canadian Standard or US Standard.⁶

Fuel restrictions

- Only biomass, manufactured fuels, natural gas, propane, low-sulphur fuel, biogas, or landfill gas may be used as fuel for a boiler or heater.

Emission standards for biomass-fuelled boilers and heaters

- When using biomass as fuel, emissions from a boiler or heater will be required to meet the following emission standards (Table 1.), except during the first 60 minutes after a boiler or heater is started and on beginning shut down procedures.

⁵ Impermeable includes: soil with a 1×10^{-7} cm/s or lower hydraulic conductivity, a synthetic liner or tarp, or concrete pad.

⁶ "Canadian standard" means "CSA B415.1-10 Performance testing of solid-fuel-burning heating appliances", published by the Canadian Standards Association; and "US standard" means the following standards published by the United States Environmental Protection Agency, in relation to boilers and furnaces, and are roughly equivalent for emission limits.

Table 1. Emissions from Boilers and Heaters Fuelled by Biomass

Boiler or heater capacity	Particular Matter Limit	Opacity Limit
Less than or equal to 1 MW	120 mg/m ³	20%
Greater than 1 MW up to 3 MW	50 mg/m ³	10%
Greater than 3 MW	35 mg/m ³	10%

- A director may set a minimum stack discharge height for a boiler or heater fuelled by biomass.

Testing and monitoring for biomass-fuelled boilers and heaters

Opacity testing

- An agricultural operator will be required to visually assess the opacity of the emissions from a boiler or heater as least once during each day of operation.
- If the emissions from a boiler or heater exceed the opacity limit, agricultural operator will be required to record the date on which emissions limits were exceeded, and take corrective action to reduce the emissions below the limits.

Particulate matter testing

- Emissions of particulate matter (PM) from a boiler or heater having a capacity of more than 1 MW will require testing,
 - a) within 6 months after installing, or modifying the boiler or heater to increase its capacity to more than 1 MW, or modifying it by 25% or more,
 - b) at least once during each 7 month heating period (from October 1st to April 30th), and
 - c) if the boiler or heater has a capacity of less than 3 MW and is fuelled exclusively by manufactured wood fuel, at least once during every 19 month period (from October 1st to April 30th, or every second heating season);
- PM emissions will need to be determined under standard conditions of 20°Celsius (C), 101.3 kilopascals (kPa) dry gas and 8% oxygen (O₂); when the boiler or heater is operating under normal operating conditions, at 75% or more of its capacity, except during the first 60 minutes after the boiler or heater is started and on beginning shut down procedures; and fuelled only by biomass.
- The testing method will require approval by a director.
- If the emissions from testing exceed the PM standard limits, the agricultural operator will be required to immediately notify a director; take corrective action to reduce the emissions below the PM limits within 30 days after notifying the director; and have emissions from the boiler or heater tested for particulate matter within 6 months after corrective action has been taken, and at least once in the next 7 month heating period (from October 1 to April 30 of the next year).
- In addition to the testing or monitoring requirements, a director may require a person who uses a boiler or heater to test or monitor the boiler or heater in response to a specific issue or complaint, or as part of a general compliance audit.

Record-keeping requirements

- The following records and supporting documentation that will be required to be kept if using biomass as a fuel for a boiler or heater include the type, source and quantity of fuel burned by the boiler or heater; all inspections and maintenance of the boiler or heater; and the results of testing or monitoring.

- The records and supporting documentation will be required to be kept for at least 3 years after the record was made, and be submitted to a director or an officer within 5 business days of a request for them being made by a director or officer.

6. Minimum Setbacks

Minimum setback distances that support desired environmental outcomes and good agricultural practices will continue to be required for:

- permanent storage structures, and composting structures;
- temporary field storage of manure, other agricultural by-products, nutrient sources and soil conditioners; and outdoor composting sites;
- storage and use of wood residue;
- land applications of manure, other agricultural by-products, nutrient sources and soil conditioners; and
- mortality management (including burial, incineration and composting).

Minimum setbacks act as a buffer to reduce risks that leachate or contaminated surface runoff would negatively impact water quality. Setback distances associated with surface water protection and the kinds of practices or setbacks associated with groundwater protection may differ. In high risk areas or high risk conditions, and in cases of specific concerns or chronic problems, a greater setback distance may be required by a director.

Table 2. (following), outlines the required minimum setbacks from drinking water sources, and watercourses that will remain the same as the current AWCR, while setbacks for land applications, and from property boundaries are newly proposed, and are consistent with local government bylaws and other regulations (e.g., the B.C. *Drinking Water Protection Act*).

Table 2. Type of structure or activity	Proposed minimum setback distances from		
	Domestic Water Source	Top of watercourse bank, or high water mark	Property boundary (of the agricultural operation)
For manure, other agricultural by-products and other nutrient sources			
Permanent storage structures	30 meters	15 meters	4.5 meters
Composting structures	30 meters	15 meters	4.5 meters
On-ground under outdoor pen storage	30 meters	15 meters	4.5 meters
Temporary field storage if stored for less than 2 weeks	30 meters	15 meters	4.5 meters
Temporary field storage if stored for 2 weeks or more	30 meters	30 meters	4.5 meters
Outdoor composting site	30 meters	15 meters	4.5 meters
Land applications	30 meters	1.5 meters	1.5 meters

Red text are new proposed minimum setbacks.

Table 3. (following), sets out minimum setbacks required for management of mortalities on agricultural operations, with current setbacks that remain the same, and newly proposed setbacks from property boundaries.

Table 3.	Proposed minimum setback distances from			
Type of activity	Domestic Water Source	Top of watercourse bank, or high water mark	Property boundary (of the agricultural operation)	Between pits closed less than 10 years
Disposal of Mortalities and Solid and Semi-solid Wastes				
Edges of Burial pit	30 meters	30 meters	4.5 meters	60 meters
Incinerator	30 meters	15 meters	7.5 meters	—
Outdoor composting site	30 meters	15 meters	4.5 meters	—
Composting structures	30 meters	15 meters	4.5 meters	—
Confined Livestock Areas (CLAs, e.g., feedlots, pastures)				
CLAs with 10 or more animal units (AU)	30 meters	30 meters	1.5 meters	—
CLAs with less than 10 animal units (AU)	30 meters	5 meters	—	—
Seasonal Feeding Areas and Grazing Areas (if applicable)				
On-ground feeding locations, and mobile feeding bins	30 meters	30 meters	4.5 meters	—

Red text are new proposed minimum setbacks.

7. Storage

The objective for the proposed storage requirements is protection of air quality, surface water quality and groundwater quality by limiting negative impacts from emissions, leachate and contaminated runoff that can be generated by agricultural activities, such as storage.

The proposed requirements include:

- Agricultural by-products (including manure, composted materials, soiled bedding, post-mushroom substrate and digestates, etc.) will be allowed to be stored on an agricultural operation only if they are produced or used for agricultural purposes on that an agricultural operation.
 - An exception for liquid manure storage is proposed to accommodate a practice on some agricultural operations (e.g., dairy) — liquid manure may be stored temporarily off-site at another agricultural operation, or at a ‘central storage’ location, only in a permanent liquid manure storage structure, without the requirement for use at the off-site storage location. The land owner where the alternate permanent liquid manure storage is located will be responsible for following environmentally protective storage requirements (i.e., no leaks or overflows).
- An agricultural operation will be required to have sufficient storage capacity for all nutrient sources⁷ until the nutrients are able to be used as a fertilizer, or soil conditioner, or distributed off-site.
 - Distribution of agricultural by-products to other agricultural operations for use will not be restricted provided that handling and transport of the materials does not allow escape of the materials or leachate.

⁷ any source of nutrients used as a fertilizer or soil conditioner, including manure, composted materials, digestate, etc.

- **Allowable storage methods** include: permanent storage structures for solids and liquids (including liquid fertilizing materials and used fertigation waste water from horticultural operations); temporary field storage only for solids; and, in the case of fur-bearing animals, manure and soiled bedding may be stored on the ground under their outdoor pen structures. Effective measures will be required to control and prevent splash-outs from this on-ground under-pen storage, and to divert precipitation water from entering the on-ground under-pen stored materials.

POLIS Report recommendation

- ❖ The POLIS Report recommends that the ministry investigate concerns around the integrity of manure “pipelines” as high threat activities to groundwater.

Ministry response

- The ministry previously proposed a requirement for transport of liquids, as below.
- Transport of liquids from storage (e.g., between fields or across properties, including by truck, tank, or in above-ground or below-ground piping) will not be allowed to leak or overflow into watercourses or groundwater.
- All storage will need to be managed to prevent leachate, contaminated surface runoff, dust or solid particles from entering a watercourse, going beyond property boundaries, or leaching into groundwater, to minimize unacceptable odours that may result in air contaminants, and to deter attraction and access by wildlife, domestic pets and other vectors.
- Permanent storage structures and temporary field storage will need to follow minimum setbacks (see Setback [Table 2](#). on page 6).
 - Existing permanent storage structures may not need to meet the proposed new minimum property boundary setback provided that they do not leak or overflow.
- New or modified (by 10% or more) permanent liquid manure storage structures (including earthen storage) will be required to be designed by a qualified professional (QP) and built according to that design.

Specific protective measures proposed for **temporary field storage** include maximum 7 month storage duration, not located on areas having standing water, on water-saturated soils, or on a low-lying area in a field prone to weather-related seasonal flooding, and not on the same site in the field from year to year over a 3-year period.

- A temporary field stored pile will need to be used up over the growing season, or the pile will need to be moved.

Storage in high risk areas

- In a **high precipitation area**, temporary field storage will be required to be covered during the period beginning on October 1 and ending on April 1 of the following year. Over **vulnerable aquifers**, temporary field storage, permanent storage structures and on-ground under-pen storage systems that are modified or new, will be required to be on an impermeable base, and have a minimum of 2 meters vertical distance below the whole structure to the seasonal high water table.

High risk conditions

An agricultural operator is expected to monitor their operation and activities for impending high-risk conditions, and

- a) assess the effectiveness of existing measures or controls during high-risk conditions, to ensure that contaminated surface runoff, waste water, leachate, solids and particulate matter from storage are prevented from entering watercourses, groundwater or going beyond property boundaries, and

- b) take immediate corrective action to remedy the situation.
- For example, during strong, divergent, windy conditions, storm events, or periods of short-term intense or high rainfall, temporary field storage needs to be completely covered, and fixed so it cannot move.

POLIS Report recommendation

- ❖ The POLIS Report recommends that the requirement for an impermeable liner for the base of the storage should apply to all **existing and new** permanent and temporary manure storages, including earthen storages for liquid manure (unlined manure lagoons).

Ministry response

- The ministry previously proposed a requirement for new and modified earthen storages to be designed by a qualified professional. (Updated guidance for design and preparation of storage structures will include an impermeable base layer.)
- The ministry is proposing a new requirement for existing earthen storages for liquid manure specifically over vulnerable aquifers, that within two years of a new revised regulation, a QP assessment needs to be conducted to ensure no leaks. If found to be leaking, an impermeable base layer (or liner) or a replacement will be required.

8. Agricultural composting

The agricultural composting process under the AWCR generally involves on-site composting of manure and other agricultural byproducts, and can follow a natural, aerobic bio-degradation process. By contrast, the Organic Matter Recycling Regulation (OMRR) composting requirements have a strict documentation of temperatures, retention times and turning regimen.

The Organic Matter Recycling Regulation (OMRR) will continue to apply if the composted material contains non-agricultural materials, or if the composted material is distributed (sold or given away) and marketed using the terms “compost” or “composted” product.

The OMRR’s more restrictive requirements are not proposed for agricultural composting, but agricultural operators will be required to follow the same protective measures as other agricultural activities with potential for emissions, leachate or contaminated runoff to negatively impact the environment, such as minimum setbacks (see [Table 2](#). on page 6).

- Specifically, this includes preventing leachate, contaminated surface runoff or solid particles and dust from entering a watercourse, going beyond property boundaries, or leaching into groundwater, minimizing unacceptable odours that may result in air contaminants, and deterring the attraction and access by wildlife, domestic pets and other vectors.
- The ministry does not intend to restrict movement between agricultural operations of agricultural by-products and composted materials in support of good nutrient management. The current requirement will continue to be allowed—that is, agricultural by-products may be composted on an agricultural operation only if they are generated on that same agricultural operation, or if they are generated on other agricultural operations, but brought on to be composted for use on that same agricultural operation.

High risk areas and conditions

- In a **high precipitation area**, a composting structure and an outdoor agricultural composting pile will be required to be covered during the period beginning on October 1 and ending on April 1 of the following year.
- Over **vulnerable aquifers**, a composting structure and an outdoor agricultural composting pile will be required to be on an impermeable base.

- Production of mushroom growing media (termed Phase 1 ‘composting’) is regulated under the Mushroom Compost Facilities Regulation. The proposed revisions will apply to the agricultural activities involved in growing mushrooms, including once the composted mushroom substrate is brought on to be used on the agricultural operation to grow mushrooms.
- Activities related to mushroom production will be required to follow the same protective measures as for other agricultural activities and agricultural by-products with potential for emissions, leachate or contaminated runoff to negatively impact the environment.

9. Nutrient management and land applications

The main objectives for the proposed requirements for nutrient management are to encourage the efficient use of nutrients and to minimize and eliminate where possible, the risk of:

- runoff containing nutrients and pathogens entering watercourses, or drinking water sources,
- nutrients leaching into groundwater; and
- accumulation of excess nutrients in the environment.

Nutrient management

Nutrient management is an integral component of agriculture, but is not a requirement in the current regulation. Nutrient management is a newly proposed requirement. While application of nutrients in an appropriate manner and at appropriate rates supports healthy crops and crop growth, nutrients applied incorrectly, in excess of crop requirements, or at the wrong time can run off into watercourses and leach into groundwater, negatively impacting water quality, ecosystems and human health. Good agricultural practices include managing nutrients to reduce or eliminate these negative impacts, as well as benefit crop production.

Nutrient management and proper land application of nutrients involves consideration of the ‘4R Plant Nutrition System’ developed by the International Plant Nutrition Institute (IPNI)⁸. The 4R’s system consists of applying nutrients at the ‘Right Source, Right Rate, Right Time and Right Place’. The ‘Right Source’ and the ‘Right Rate’ components relate to the AMOUNT of nutrients being applied, and the ‘Right Time’, and the ‘Right Place’ components relate to HOW the nutrients are applied.

The proposed requirements will apply to all materials containing nutrients that are land applied. The main nutrients of concern are nitrogen and phosphorus (pathogens are also of concern), as they have the potential to cause adverse impacts to human health and the environment.

- Nutrients will be required to be applied according to a calculated application rate and in a manner that minimizes the risks of nutrient losses to the environment. A nutrient management plan (NMP) is recommended for all applications of nutrients.
- At a minimum, appropriate application rates will need to be calculated based on crop nutrient requirements and take into account all nutrient sources, including soil residual nutrient levels.
- Soil tests are needed to perform due diligence and ensure compliance with the regulation.
- Soils tests and nutrient source tests will need to be current and representative.
- The application of nitrogen from all nutrient sources will be required to not exceed the agronomic nitrogen rate.
- The application of phosphorus will be required to be based on Crop P requirement and Crop P removal.
- Calculations and the information used to calculate an application rate may be requested, or required by a director.

agronomic nitrogen rate means: the application rate at which the available nitrogen from all nutrient sources meets the nitrogen production recommendation for the crop being grown in the year of application.

⁸ International Plant Nutrition Institute, Norcross, Georgia, USA.

Environmental Risk Indicators

- Soil nutrient residual levels are proposed to be used as an indicator of environmental risk; higher levels of nutrients in the soil generally can result in higher risk for negative impact to the environment.
- Soil nutrient threshold levels are proposed that will trigger the need to do a nutrient management plan to mitigate potential risks.

Proposed requirements to trigger a nutrient management plan based on **Nitrogen** are:

- **Over vulnerable aquifers**, if the PHNT is equal to or exceeds the **threshold of 100 kilograms of nitrate-nitrogen per hectare (kg N/ha)**, a nutrient management plan will need to be prepared by a QP, and will be required to be followed.
- **In areas not defined as high risk**, if the PHNT is equal to or exceeds the **threshold of 150 kg N/ha.**, a nutrient management plan that ensures the risks of nitrogen losses to water and air are minimized must be prepared by a QP, and will be required to be followed.
 - A Post-Harvest Nitrate Test (PHNT) for outdoor field-based crops will be the test needed to measure the level of nitrates remaining in the soil. A PHNT is also used as a performance measure to assess how well agronomic application rate is being met. A PHNT of 100 – 200 kg N/ha is considered high; and a PHNT of greater than 200 is considered very high.

Proposed requirements to trigger a nutrient management plan based on **Phosphorus** are:

- **In Phosphorus Sensitive Areas**, if Soil Test P is equal to or exceeds the **threshold of 100 milligrams per kilogram (mg/kg)**, a nutrient management plan that ensures the risks of phosphorus losses to water are minimized will need to be prepared by a QP, and will be required to be followed.
- **In areas not defined as high risk**, if Soil Test P is equal to or exceeds the **threshold of 300 mg/kg**, a nutrient management plan will need to be prepared by a QP, and will be required to be followed.
 - A soils test phosphorus (Soils Test P) for outdoor field-based crops will be the test needed to measure the level of phosphorus remaining in the soil. A Soils Test P of 100 mg/kg of dry soil is considered very high. However, risk of adverse impact to the receiving environment needs to be equally considered.
 - **Table 4.** (following) shows the Environmental Risk Matrix for soil nutrient thresholds for nitrates and phosphorus and what actions will be required at what level of risk.

Table 4. Environmental Risk Matrix

		PHNT (kg Nitrate-N/ha)		
		0	100	150
High Risk Areas*	M	<ul style="list-style-type: none"> • Medium risk • Need to monitor • Records may be requested 	<ul style="list-style-type: none"> • High risk • QP-prepared NMP required • Need to reduce soil P • Keep records 	<ul style="list-style-type: none"> • High risk • QP-prepared NMP required • Need to reduce soil P • Keep records
	L	<ul style="list-style-type: none"> • Low risk • Monitor • Records may be requested 	<ul style="list-style-type: none"> • Medium risk • Need to monitor • Records may be requested 	<ul style="list-style-type: none"> • High risk • QP-prepared NMP required • Need to reduce soil P • Keep records
Not a High Risk Area		0	100	300
		Soil Test P (mg/kg of dry soil)		

* High risk areas include: vulnerable aquifers, high annual rainfall, phosphorus sensitive watercourses;

Non-field based tests

- For certain types of operations, such as cranberry operations or container nurseries, where a field-based soils test, such as PHNT, is not appropriate, the proposed requirement will be that the agricultural operator needs to demonstrate that nutrient application rate does not exceed crop nutrient requirements if requested by the Director; this may include information from other tests, such as crop tissue tests.

POLIS Report recommendation

- ❖ The POLIS Report recommendation states “Consider initiating a cap on cow density for Intensive Livestock Operations (ILO) that spread on site, while beneficial management practices, including updated, independently verified NMPs with safety factors, can be established (and confirmed), planning processes can be initiated and the aquifer has an opportunity to begin recovery.”
- The ministry is addressing the concept of ‘a cap on cow density’ indirectly by limiting the amount of nutrients that can be land applied.
- The ministry is also newly proposing additional criteria to soil-based thresholds as described above (previous page) for triggering the requirement for a nutrient management plan, based on, for example, animal numbers, density, or nutrient units. These triggers may include: number of animal units (1 AU = 455 kg), e.g., 50 animal units or more for dairy, 100 AU or more for feedlots; 10 AU or more per hectare; size of agricultural land-base, e.g., horticultural operations, except orchards and vineyards, exceeding 20 hectares.
 - These additional criteria are not intended to capture (a) cow-calf operations, which typically have a larger land-base with lower nutrient inputs, or (b) agricultural operations that do not land apply nutrients, e.g., poultry operations that export all their manure. Operations that export would, however, need to keep manure transfer records regarding the export, e.g., quantity, receiving site.
 - All agricultural operations would still be subject to the soil-based thresholds.

POLIS Report recommendation

- ❖ The POLIS Report recommends that, within the recommendation for an Area-based Management Plan, nutrient management plans be required and independently verified (and approved by government) and contain a safety factor.

Ministry response

- The ministry is proposing a new requirement to enable a Director on a case-by-case basis, and based on evidence of negative impact, or potential negative impact, to require an NMP, that a required NMP needs to be independently verified, and that the director may require a safety factor.
- To better fulfill the ministry’s mandate for protecting human health and the environment, and preventing pollution, the ministry is proposing to implement a tracking and verification process for operations located in high risk areas as part of nutrient management. This may include submission of information from individual operations (e.g., the type, size and number of operations, nutrient management plans) and collection of related information, from agencies, such as water quality monitoring data.

Land applications

- Proposed land application requirements include: no direct discharges into a watercourse or groundwater; nutrient sources are to be applied only as a fertilizer or soil conditioner; and composted material must not contain bones with visible signs of flesh, flesh or tissue, more than 1% foreign matter by dry weight, or any sharp foreign matter in a size or shape that could cause injury.
- Protective measures proposed for land applications will include minimum setbacks (see [Table 2.](#) on page 6); preventing leachate, contaminated surface runoff, and drift from sprayed materials from entering watercourses, groundwater, or going beyond the property boundaries; and methods and rates of application must not allow direct runoff into a watercourse or groundwater, or to go beyond the property boundary.

High risk areas and conditions

Proposed prohibited applications

- No land applications of agricultural by-products will be allowed:
 - on frozen or snow-covered ground, on areas having standing water, on saturated soils;
 - during strong or diverting winds, stormy conditions, or short-term intense or high rainfall; and
 - from October 1st to March 31st **in high precipitation areas.**

Proposed restricted applications

- The ministry is considering a request to allow land applications of agricultural by-products **in high precipitation areas** in the months of October, February and March (a “shoulder season”), if for each field,
 - an application risk assessment⁹ is prepared, and indicates a low risk for runoff or leaching, and is satisfactory to the Director, and
 - nutrients are needed and will be available and taken up by a current growing crop.
- Records of land application information and the risk assessment (if applicable) will need to be kept and may be requested.
- Specified measures and controls in high risk areas or high risk conditions, or resulting from concerns or chronic problems identified by the ministry may be required by a director.

POLIS Report recommendation

- ❖ The POLIS Report recommends that “Irrigation Management Plans (IMP) be required on a farm-by-farm basis in high risk areas”. The POLIS report states over-irrigation can lead to inefficient use of water and leaching of contaminants into surface and groundwater by pushing nutrients out of the root zone. The nutrients are moved more readily where water content in the soil is high.

Ministry response

- The ministry is proposing a new requirement that, for fields over vulnerable aquifers, an irrigation scheduling* process be undertaken and documented to ensure that the application of irrigation water matches soil and crop needs.
 - An irrigation system assessment or irrigation management plan may be triggered for completion in high risk areas or, on a case-by-case basis and on available evidence, as required by a Director.

* Irrigation scheduling is the process used to match the application of irrigation water to the soil and crop needs. The key objective of irrigation scheduling is to reduce water loss due to overland flow or leaching. See the [EFP Reference Guide](#).

⁹ The ministry is working with Ministry of Agriculture staff to develop an Application Risk Assessment (ARM) tool.

POLIS Report recommendation

- ❖ The POLIS Report recommends that “a temporary environmental protection order (moratorium) under the *Environmental Management Act* on liquid animal waste spreading on identified areas of concern (in Hullcar Valley) in intensive livestock operations (ILO)” be issued.

Ministry response

- The proposed revisions will provide outcome-based requirements to protect the environment and prevent pollution.
 - The proposed requirements address the concept of a “temporary moratorium” by prohibiting land applications in high precipitation areas, including over vulnerable aquifers, during the months of October through to March.
 - The proposed requirements address the concern regarding intensive livestock operations by limiting the amount of nutrients applied to the crop, which should reduce risks of excess nutrients leaching into the aquifer.
 - The ministry is proposing a new requirement to enable a Director, on a case-by-case basis, and based on evidence of negative impact, or potential negative impact, to require that no land applications may occur over a vulnerable aquifer for:
 - a) a certain period of time (e.g., high risk area or condition), and/or
 - b) until soils testing suggests, or other testing (e.g., water quality monitoring data) indicates improvement in the water quality (e.g., nitrate levels have decreased below drinking water quality guidelines).

10. Storage and use of wood residue

The ministry proposes replacing the term ‘wood waste’ in the current regulation with ‘wood residue’. Wood residue (which includes sawdust, shavings, wood chips, hog fuel, mill ends and bark), has significant agronomic uses, such as a component for composting, and for soil amendments, or mulches. However, concentrated leachate from wood residue is toxic to aquatic life and can negatively impact the environment and human health. Allowable and prohibited uses and protective measures for storage and use of wood residue for agricultural purposes are proposed.

Wood residue – Proposed general requirements

- Only clean wood residue will be allowed to be used, or stored for later use, for agricultural purposes on an agricultural operation.
- Wood residue from wood products or byproducts not originating on the agricultural operation that have been treated with glue, paint, preservatives, or other chemicals, or coated with paints, varnish, oils or other finishing materials, or are from salt-laden wood, or demolition or construction, will be prohibited from storage or use.
- Use and storage of clean wood residue will need to be managed to prevent solids or particulate matter, dust, and leachate or contaminated runoff from entering a watercourse, or going into groundwater, or beyond the property boundary.
- No direct discharges of wood residue into watercourses or into the groundwater will be allowed.
- Leachate will need to be collected and contained, and precipitation flowing along the surface diverted from entering wood residue piles.

Proposed allowable uses for wood residue

- Clean wood residue will be allowed to be used only as plant mulch, horticultural bedding, soil conditioner or ground cover, a component for composting, livestock bedding and in areas where livestock, poultry or farmed game are confined or exercised, for on-farm access ways, and as fuel for wood-fired boilers.
- High risk uses of wood residue, such as for berm construction, as fill, as an envelope for tile drains, to level a site, or to create access through a swale, wetland or watercourse will not be allowed.

Minimum setbacks

- Minimum setbacks (see Table 5. following) will continue to be required and new minimum setbacks are proposed. **Red text** are new proposed minimum setbacks.

Table 5. Proposed minimum setback distances			
Type of structure or activity	Domestic Water Source	Top of a watercourse bank, or high water mark (not a domestic water source)	Property boundary (of the agricultural operation)
Clean Wood Residue (from edge of pile)			
Permanent storage structures and Temporary field storage	30 meters	15 meters	4.5 meters
Solid layer of 30 centimeters deep or more on the ground surface	30 meters	15 meters	1.0 meter
Land application for mulch, bedding	3 meters	1.5 meters	1.0 meter

- Maximum depths and amounts based on the use, recommended in guidance, are expected to be followed; e.g., 5 – 8 cm for a mulch, or up to 10 cm as a soil conditioner, or a one-time application of up to 30 cm for development of berry fields.
- The ministry is not proposing a minimum setback if wood residue is immediately tilled into soil during application as a soil conditioner.

11. Livestock and poultry operations

Management of point source and non-point source discharges is particularly important on agricultural operations with livestock and poultry. Proposed provisions include general and specific requirements for confined livestock and poultry areas, including confined feeding areas, such as feedlots, and seasonal feeding areas, grazing areas, and non-feeding areas, such as corrals and exercise areas.

Confined livestock and poultry areas

- Direct access to watercourses will continue to not be allowed for confined livestock and confined poultry areas.
 - Confined livestock and confined poultry areas will be required to have effective controls in place for runoff management and groundwater protection.
- Accumulation of the manure/feed/bedding in confined livestock and poultry areas needs to be actively managed to prevent the escape of solids or particulate matter, excessive dust, leachate and contaminated runoff from entering a watercourse, going off the property, or leaching into groundwater.
- Any leachate from the confined livestock or confined poultry area must be collected and contained, and precipitation water flowing along the surface must be diverted from entering the confined area.

Minimum Setbacks

- Current and newly proposed minimum setbacks (as per Table 3. on page 7) will be required for confined livestock or confined poultry areas.

Feedlot-specific proposed requirements

- A feedlot will need to be managed so that if an intact protective layer develops (e.g., also termed gleyed layer, or black interface layer), the protective layer is maintained, i.e., does not allow leaks.
- Based on evidence or a concern, a director may require a feedlot to monitor for leakage, and/or a protective base to be installed.
- A feedlot that will no longer be used will be required to be decommissioned by removing the manure pack and cleaning the pens in a manner that prevents leachate from entering groundwater or a watercourse, and allows nutrients from the manure to be applied as a fertilizer or soil conditioner.

High Risk Areas

- Over vulnerable aquifers, agricultural operators will be required to notify a director 90 days prior to establishing a new feedlot.

❖ The above proposed requirement also addresses the POLIS Report recommendation regarding the identified areas of concern in intensive livestock operations (ILO).

- In high precipitation areas, a new feedlot without a roof covering will be required to have an impermeable protective base layer, and a minimum vertical distance of 1.2 m from the bottom of the protective layer to the seasonal high water table.

Seasonal feeding areas, grazing areas and temporary holding areas

Proposed requirements include:

- Livestock and poultry in a seasonal feeding area, grazing area, or temporary holding area will continue to be allowed direct access to watercourses for drinking.
- Effective controls will be required to be in place to minimize trampling and erosion of soil, and contaminated surface runoff, leachate and solids from entering the watercourse.
- Livestock and poultry in a seasonal feeding area or a grazing area will be required to be moved from areas that are flooded, e.g., during an annual seasonal flooding event.
- In a seasonal feeding area, while livestock or poultry are present, on-ground feeding locations and mobile feeding bins will need to follow current and proposed new minimum setbacks (as per Table 3. on page 7), and be distributed evenly over the seasonal feeding area, in a manner that prevents the accumulation of manure near feeding locations or bins, and not be located in areas that are flooded, or during annual seasonal flooding events.
- Livestock will not be allowed to be held in a temporary holding area for longer than 72 hours.

12. Managing mortalities and small slaughter operation processing wastes

Management of mortalities is an important element of agricultural practices with significant potential for both beneficial use and risk to environmental values. Small slaughter and poultry processing operations¹⁰ that are on an agricultural operation are exempt from the provisions of the Code of Practice for the Slaughter and Poultry Processing Industries (the Slaughter Code). These operations fall under the current AWCR and will be specifically addressed in the proposed revised regulation.

¹⁰ Small slaughter and poultry processing operations are those producing less than 5 tonnes of live weight killed (LWK) red meat per year or less than 1.5 tonnes of LWK poultry meat per year.

Burial, incineration and composting will continue to be acceptable methods for disposing of normal mortalities on an agricultural operation. Acceptable practices and guidance for reducing risk of attracting wildlife in rural, semi-rural, and peri-urban areas will be developed in consultation with the agriculture industry and the Ministries of Agriculture, and Forests, Lands and Natural Resource Operations and Rural Development.

Disposal of “mass carcasses” —such as deaths caused by or associated with a reportable disease, flooding, or other disaster leading to large casualties of livestock or poultry, over what would be considered “normal mortality”— is not within the scope of the current or proposed revised regulation and requires specific separate authorization under EMA.

Proposed general requirements for managing mortalities include:

- **Storage** - If mortalities need to be stored prior to disposal, mortalities will be required to be contained so that there are no leaks of leachate, or emissions of unacceptable odours, and in a manner that prevents putrefaction and access by wildlife, domestic pets or other vectors.
- **Minimum setbacks** will be required to be followed (as per [Table 3](#) on page 7).
- **Transport of mortalities** to recognized off-site disposal facilities will need to be undertaken in a manner that prevents escape of carcasses or leakage of leachate.
 - Mortality transport may also need to be in accordance with federal, provincial and municipal biosafety and transport regulations.
- There will be provisions for ministry staff to request and/or require records of how mortalities and processing waste are managed if there are specific concerns (e.g., in high risk areas or conditions) or chronic problems (i.e., compliance history). Specific record-keeping and management practices may be set out in an advisory or an order, based on the ministry’s compliance framework.

Proposed requirements for managing [processing wastes from small on-site slaughter operations](#) include:

- Processing wastes include the solid and semi-solid wastes, and waste water from the on-site slaughter and poultry processing operation.
- Processing wastes stored on an agricultural operation may only be from a small on-site slaughter operation on that same agricultural operation, or from the animals raised on that same agricultural operation (but slaughtered off-site);
- If being stored prior to disposal, processing wastes will be required to be stored only in a covered container that does not leak or overflow, and prevents putrefaction and access by wildlife, domestic pets or other vectors.

12.1 Burial of mortalities

- On-site burial will continue to be allowed for normal mortalities, and small quantities of processing wastes (if applicable).
- Proposed requirements related to burial of mortalities and processing wastes include:
 - maximum quantity of 2.5 tonnes per single burial pit; and
 - protective measures include site criteria, e.g., not located in or over coarse, sandy soils, in or close to unstable soils, or in standing water, water-saturated soils, or low-lying area prone to seasonal flooding, and
 - covering requirements for burial pits or trenches,
 - minimum vertical distance of 1.5 meters from bottom of pit to groundwater, maximum slope of land and minimum setbacks from unstable areas, watercourses and other burial sites (as per [Table 3](#) on page 7), and
 - closure requirements.

- Burial records may be requested or required by a director, and will include site criteria and geographic location.

High Risk Areas

- A higher level of protection for high risk areas or conditions will be required, for example, in some high risk areas, burial may not be allowed, such as where there is a high water table.

12.2 Incineration of mortalities

On-site incineration will continue to be allowed for normal mortalities, and small quantities of processing wastes if applicable. There will continue to be opacity and emissions requirements for incinerators.

Proposed requirements for incineration of mortalities and processing wastes will include:

Opacity limits

- Smoke emissions (measured by opacity readings) from existing and new mortality incinerators will need to meet a maximum opacity limit, averaged over the mortality incineration stage.

Particulate matter limits

- Maximum emission standards for particulate matter, measured at O₂ reference level of 11%, 25°C and 101 kPa, will need to be met during operation of incinerator, except during a brief start-up period and once shut-down procedures have started.

Table 6., following, sets out the proposed maximum allowable emissions standards.

Red text are new proposed standards.

Table 6.	Maximum Allowable Emission Standards				
	Chamber capacity	Particulate matter limit	Stage of operation	Opacity limit	Stage of operation
Existing Mortality Incinerators	all	180 mg/m ³	except during start-up and shut-down	20%	At any point during operation
New & Replacement mortality incinerators	Less than 185 kg	175 mg/m ³	except during start-up and shut-down	20%	At any point during operation
	185 kg or greater	155 mg/m ³	except during start-up and shut-down	10%	After reaching operating temperature

Minimum setbacks

- Location of incinerators will be required to meet minimum setbacks (as per Table 3. on page 7).
- Other measures for protection of the environment and human health may be required, based on ministry concerns and compliance history. For example, incineration records may be requested or required by a director, including current forecast, venting index, weather conditions before and during operation, start-up period, total burn time, quantity and type of mortalities and processing wastes incinerated, and amount of smoke produced (e.g., opacity assessments).

12.3 Composting of mortalities

On-site composting of mortalities and small quantities of solid and semi-solid processing wastes (if applicable), will continue to be allowed. Mortalities and solid and semi-solid processing wastes added to the agricultural composting will need to follow these proposed requirements to meet quality standards.

- Good management practices for the composting and curing piles (e.g., maintained in an aerobic state and meeting temperature and retention times) should be followed to meet quality standards, and to ensure

that all parts of carcass, and the solid and semi-solid processing wastes are completely degraded – e.g., bones fully decomposed. Screening of the composted materials may be needed prior to land application to ensure that no distinguishable animal parts are present in finished compost and applied on fields.

Proposed requirements related to [composting of mortalities and small quantities of solid and semi-solid processing waste](#) include:

- The composting structure or site will need to meet the same minimum setbacks as per [Table 3](#), on page 7, and not be located on areas having standing water, on water-saturated soils, or on a low-lying area in a field prone to weather-related seasonal flooding.
- Effective controls will need to be in place to
 - a) prevent leachate or contaminated runoff from a composting structure or outdoor composting site from entering a watercourse, going beyond property boundaries, or leaching into groundwater,
 - b) minimize unacceptable odours that may result in air contaminants,
 - c) prevent solid particles from composting and curing materials from entering a watercourse or going off the property, and
 - d) deter attraction and access by wildlife, domestic pets and other vectors.
- If more than 5,000 kg of carcasses are to be composted together at one time, a Director will need to be notified and may require that a separate authorization be obtained, as this may be related to mass carcass disposal.
- Records may be requested or required by a director, and may include the number and type of animals and quantity of processing waste composted, land application locations, dates, amounts, and final disposal method.

13. Record-Keeping

- Accurate, appropriate and timely record-keeping is considered good management practice that shows due diligence and can demonstrate due diligence and effective management is being followed. Basic record-keeping is expected – information that would be required is stated specifically in the various topic sections throughout this intentions paper.
- The revisions will include provision for a director or compliance staff to request and/or require records; for example, how nutrients are managed, especially in high risk areas or during high risk conditions, or resulting from a compliance inspection. Specific nutrient management record-keeping and practices may be set out in an advisory or an order, based on the ministry's compliance framework.

14. Corrective Actions

- Prior to an inspection, it will be expected that corrective actions will be taken to remedy a problem as soon as the problem is found or identified. This due diligence will be considered in any compliance efforts.
- Based on a concern, complaint, or a continuing problem, a Director may require corrective actions, such as in an advisory, a warning or an order.

Approach to compliance

Ministry staff follow an established [Compliance Framework](#) and [Compliance Policy and Procedures](#) when addressing compliance with Acts and regulations under its mandate. The ministry aims to set regulatory requirements that are clear, practical, achievable and enforceable to encourage the support and compliance of individuals and businesses.

Ministry staff work first to establish and communicate clear regulatory objectives, related to protection of the environment and human health, and clear guidance to support compliance. Assessing compliance involves monitoring and verification, assessment of risks and hazards posed by non-compliance, and the specifics of each situation (e.g., history of compliance or non-compliance). It is intended that a phase-in approach to implementation will be used once the regulation is revised. For example, requirements regarding temporary field storage in high risk areas or conditions will be required upon the effective date of the revised regulation; whereas the requirements for nutrient management planning will be phased-in over a few years, based on an agriculture operation's environmental risk. A range of tools is available to respond to non-compliance, from advisories and warnings to orders, tickets and administrative monetary penalties to prosecutions. Decisions on which tool or tools to use are made using a compliance matrix—based on factors such as the significance of the impact to the environment and human health, non-compliance history, the willingness of the individual to share information and respond, and their due diligence in responding to the event.

Working with agricultural organizations, industry sectors and other agencies (such as the Ministries of Agriculture and Health) – and through other programs (such as the [Environmental Farm Plan \(EFP\) Program](#)) – on education and awareness initiatives will help ensure producers are aware and understand the requirements for protection of the environment and human health.

Providing comment

The ministry welcomes comments on the proposals outlined in this intentions paper. Comments can be provided to the Ministry of Environment and Climate Change Strategy by e-mail attachment to the e-mail address below, or by mail to the address listed below. Responses received by January 15, 2018, will be considered by the ministry in updating the Agricultural Waste Control Regulation.

Consultation questions and a comment form have been prepared and are posted on the ministry's [AWCR web site](#). Those interested are invited to submit comments to the ministry using the comment form and discussion questions or by separate submission if desired.

All submissions will be treated with confidentiality when preparing consultation reports. Please note however that comments you provide and information that identifies you as the source of those comments may be publicly available, if a Freedom of Information request is made under the *Freedom of Information and Protection of Privacy Act*.

Please send all submissions or if you have any questions or comments regarding this information, as well as comments on the ministry's schedule for the consultation process, to the following:

E-mail: env.ag.reg.reviews@gov.bc.ca
Mail: BC Ministry of Environment and Climate Change Strategy
PO Box 9341 Stn Prov Govt
Victoria BC V8M 9M1
Attn: Margaret Crowley

Comments to the ministry should be made on or before **January 15, 2018**.

Thank you for your time and comments!