Sewerage System Design Considerations for the Cannabis Industry

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Overview

1. BACKGROUND – THE CANNABIS INDUSTRY
2. DESIGN CONSIDERATIONS – ONSITE SEWAGE SYSTEM MANAGEMENT
3. WASTEWATER COMPONENTS AND TREATMENT OPTIONS

Background
The Cannabis Industry

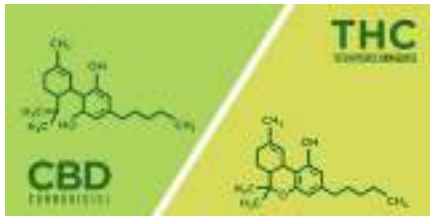
Cannabis Clarity

Cannabis

- IS A FLOWERING PLANT
- USES CO_2, WATER AND LIGHT TO GROW
- USED IN RAW FORM OR PROCESSED FURTHER TO CREATE CANNABIS OIL

Cannabis Clarity

Cannabis



Cannabinoids
THC and CBD

Hemp

- Low THC (0.3% dry wt. vol.)
- Industrial uses
  - Food
  - Fabric

Marijuana

- High THC (10-30% dry wt. vol.)
- Recreational
- Medical

THE COMMERCIAL PRODUCTION AND MANUFACTURING OF BC BUD IS AN EMERGING SECTOR….

CANNABIS – LEGALIZATION

Government of Canada / Gouvernement du Canada

Canada

BRITISH COLUMBIA

Supported by the Province of British Columbia

CANNABIS ACT (C-45)

- OCTOBER 17, 2018
- LEGAL FRAMEWORK
- CONTROL AND REGULATE PRODUCTION, DISTRIBUTION AND SALE

BC REGULATION

- BC LIQUOR DISTRIBUTION BRANCH(LDB)
- LIQUOR AND CANNABIS REGULATION BRANCH (LCRB)

GROWING AT HOME

- (19+) 4 NON-MEDICAL CANNABIS PLANTS PER HOUSEHOLD


Government of Canada
Gouvernement du Canada
Canada
BRITISH COLUMBIA
Ministry of Environment and Climate Change Strategy
BRITISH COLUMBIA
Ministry of Agriculture
BRITISH COLUMBIA
Ministry of Health

Cannabis and the Environment

3 CULTIVATION METHODS

1. INDOOR
2. OUTDOOR and
3. GREENHOUSE

3 WASTE STREAMS

1. AIR
2. SOLID
3. LIQUID

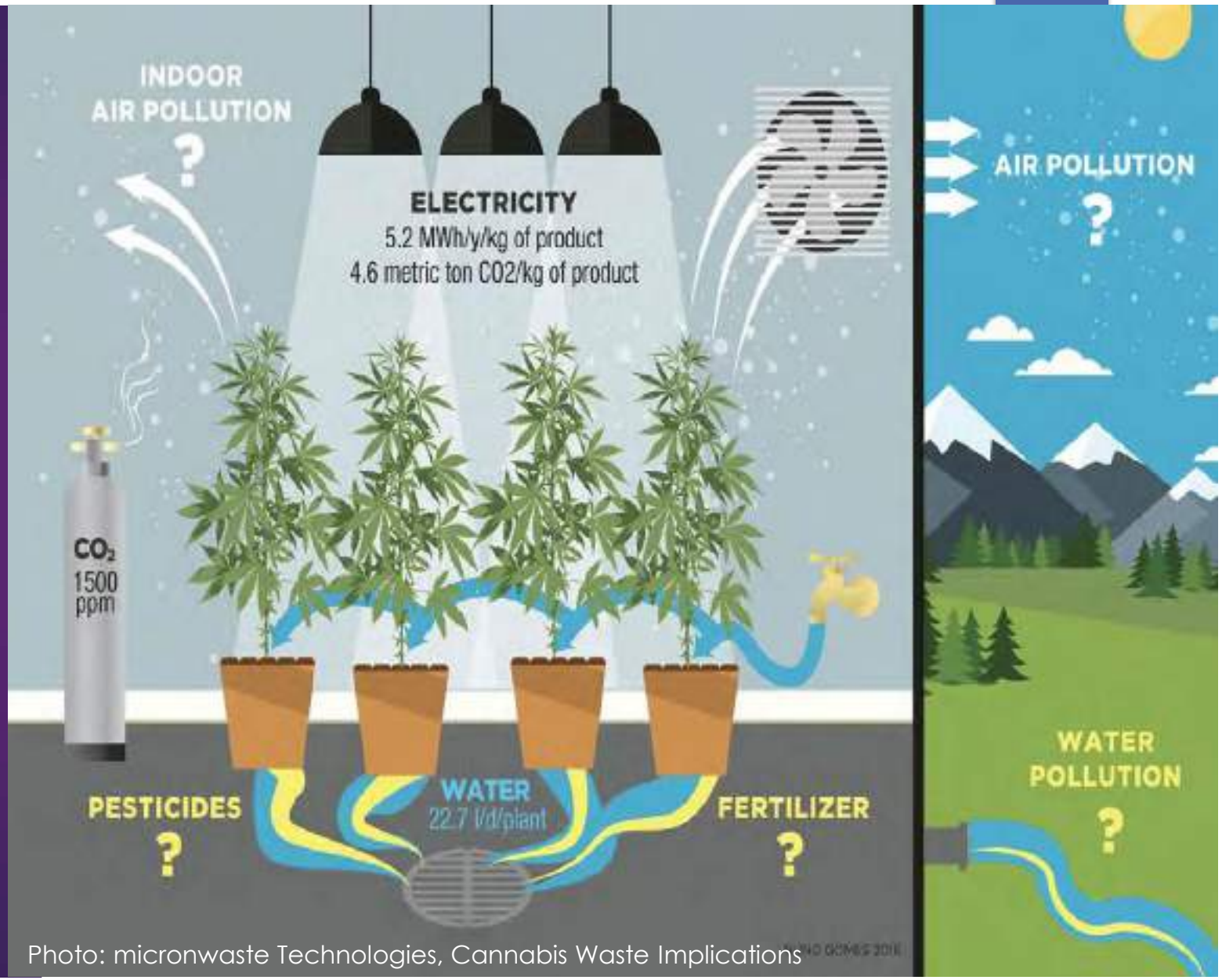


Photo: micronwaste Technologies, Cannabis Waste Implications

Considersations
Onsite Sewage System Management

Septic Design Considerations

CANNABIS FACILITY DECLARATION

- WATER SUPPLY SOURCE/SETBACK CONSIDERATIONS
- CANNABIS CULTIVATION METHOD (INDOOR, OUTDOOR, GREENHOUSE)
- SIZE OF BUILDING
- #EMPLOYEES/SHIFT INFORMATION
- # TOILETS, SINKS, SHOWERS, WASHING MACHINES
- SPECIAL CLEANING PRACTICES (IE: SANITATION BASED WASTEWATER)
- CAFETRIA FACILITIES (IE: CLEANERS, F/O/G, GARBURATORS)

TABLE III-11 SPM V3 –AVERAGE DAILY FLOWS

DESCRIPTION	UNIT (PER)	AVERAGE FLOW (L/DAY PER UNIT)	AVERAGE DAY BOD (GRAMS/DAY PER UNIT)
INDUSTRIAL, COMMERCIAL (DOMESTIC/FOOD SERVICE WASTE)			
Office/factory without cafeteria	person	50 to 75	30
Office/factory without cafeteria and with showers	person	75 to 125	35
Office/factory with cafeteria	person	100	38
Open site (e.g. quarry) without canteen	person	60	25
Full time day staff (staff figures apply to all applications)	person	50 to 75	38
4 hour shift day staff (staff figures apply to all applications)	person	45	25
AMENITY SITES – TOILET AND SHOWER BLOCKS			
Shower	use	40	6
Toilet urinal	use	5	1.5
Toilet (WC)	use	10	12

Example Calculation

Indoor Cannabis Cultivation Facility – with showers without kitchen/cafeteria

Size of building - 15,000ft^2
employees/shift information – 20 employees 8 hour shifts
water closet (toilet and sink) – 4; each employee average use 5 times during day
showers – 4; 15 employees will shower each day due to process requirements
washing machines – 1; 3 loads a day for cleaning purposes

Based on Table III-11; Peaking Factor 2
Method 1: Average flow based on facility use (75-125 L/day per person); peaking factor 2
=125L/day/person * 20 employees * 2 (P.F.) = **5000 L/day DDF**

Method 2: WC (10L/day/use) + Shower (40L/day/use) + Washing Machine (200L/day/use)
= (10*20people*5times/day) + (40*15 uses/day) + (200*3 uses/day)
= (1000 L/day + 600 L/day + 600 L/day) * 2 (P.F.) = **4400 L/day DDF**

What's Going Down the Sewer?

CANNABIS FACILITY DECLARATION

- BOD – MEASURE OF ORGANIC MATTER (SEWAGE, DETERGENTS, FATS, GREASES, FOOD)
- PATHOGENS – PARASITES, BACTERIA, VIRUSES
- SOLIDS – TSS, TDS
- CHEMICALS – CHLORINE, AMMONIA, NITROGEN, PHOSPHORUS

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

POLLUTANTS:

FERTILIZERS
CLEANING PRODUCTS
DOMESTIC SEWAGE

EXTRACTION

FOOD PRODUCTION

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

MITIGATION STRATEGIES:

ELIMINATE SEWER ENTRY POINTS
UPSIZE PRIMARY TREATMENT (ROI)
CONSIDER SECONDARY TREATMENT

EXTRACTION

FOOD PRODUCTION

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

EXTRACTION

POLLUTANTS:

SOLVENTS

FOOD PRODUCTION

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

EXTRACTION

MITIGATION STRATEGIES:

EMPLOY CLOSED LOOPS
ELIMINATE SEWER ENTRY POINTS

FOOD PRODUCTION

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

EXTRACTION

FOOD PRODUCTION

POLLUTANTS:

FATS, OILS, GREASE

DETERGENTS

FOOD WASTE

WHAT'S GOING DOWN THE SEWER?

CULTIVATION

EXTRACTION

FOOD PRODUCTION

MITIGATION STRATEGIES:

INSTALL GREASE TRAPS
UPSIZE PRIMARY TREATMENT
CONSIDER SECONDARY TREATMENT

CONCLUSIONS

- ASK a lot of questions and get the answers
- ELIMINATE process water (ie: floor drains, extraction solvents, wash bibs)
- UNDERSTAND cleaning practices
- IDENTIFY staffing patterns and facilities available to staff
- INCLUDE planned expansions
- BE INFORMED - don't let client cheap out on system size

THIS IS JUST THE BEGINNING – LOTS OF FUTURE LEARNING TO BE HAD…….