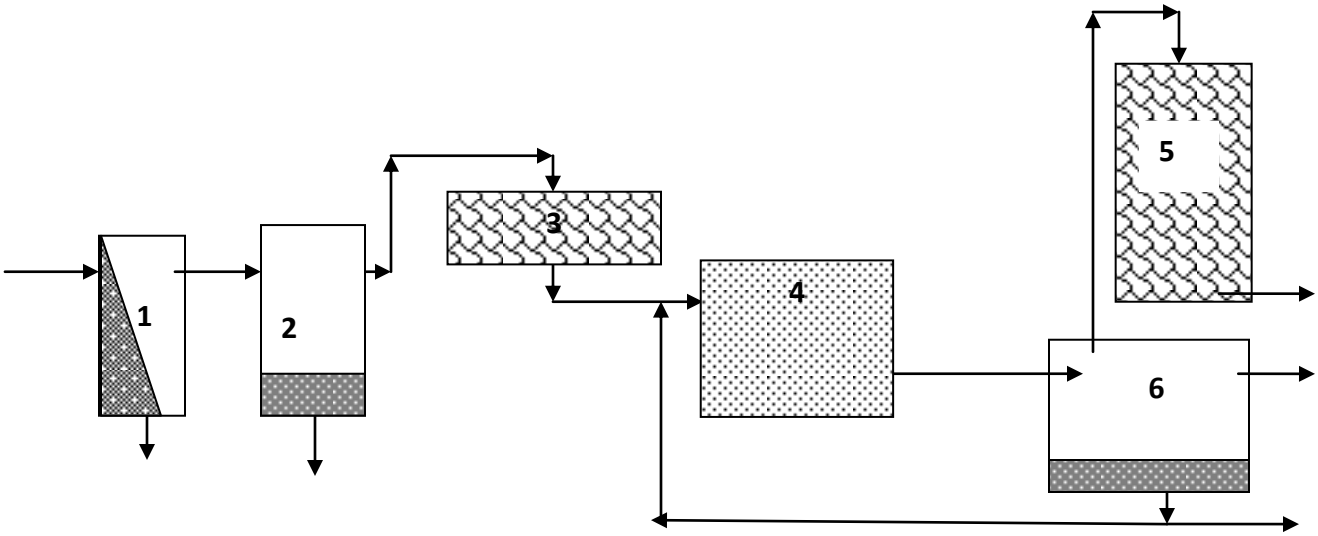
CVEN 4830/4434: CIVIL/ENVIRONMENTAL ENGINEERING DESIGN PROJECT SPRING 2008

BOULDER WASTEWATER TREATMENT PLANT

CURRENT UNIT PROCESS FLOW DIAGRAM

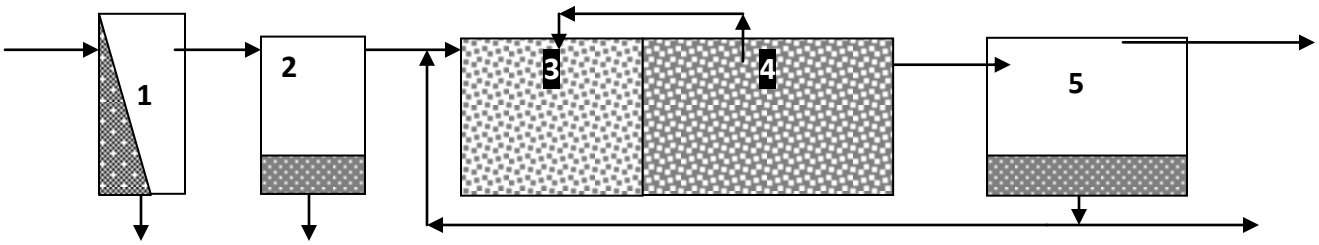


KEY

Number	Name	Removal/Conversion	Addition	Residuals
1	Headworks	Large solids screened	Mechanical power	Screening to Landfill
2	Primary Clarifier	50-60% suspended solids	None	Primary sludge
3	1st stage triclking filter	80-85% BOD removed	Power to Dosing Pumps, Blowers for air supply and scrubbing	None
4	Solids Contact	10-15% BOD removed	Blower for air (O_2)	None
5	Nitrifying trickling filter	25-75% ammonia oxidized to nitrate	Blower for air (O_2)	None
6	Secondary Clarifier	99% suspended solids removed	Pumping for recycled biomass	Secondary Sludge

<u>Current Effluent contains:</u>
Low soluble and particulate BOD/COD
Low ammonia nitrogen (NH_4-N)
High nitrate-nitrogen (NO_3-N)
Low suspended solids (TSS)

FUTURE PROCESS FLOW DIAGRAM



KEY:

Number	Name	Removal/Conversion	Addition	Residuals
1	Headworks	Large solids screened	Mechanical power	Screenings to Landfill
2	Primary Clarifier	50-60% suspended solids	None	Primary sludge
3	Activated sludge mixed basin (anoxic)	50-75% BOD removed, Nitrate reduced to N_2	Mixing, Power for recirculation pumps	None
4	Activated sludge aeration basin (aerobic	25-50% BOD removed, ammonia oxidized to nitrate	Blower for air (O_2)	None
5	Secondary Clarifier	99% suspended solids removed	Pumping for recycled biomass	Secondary Sludge

<u>Future Effluent contains:</u>
Low soluble and particulate BOD/COD
Low ammonia nitrogen (NH_4-N)
Low nitrate-nitrogen (NO_3-N)
Low suspended solids (TSS)
Potential to remove excess phosphorus