From the foregoing it will be apparent that the instant invention provides extremely accurate and reliable equipment for automatically sampling and monitoring a remotely located effluent or wastewater discharge. The signal which is developed by the probe **14** and transmitter **13** is accumulated by the integrator **24**, which then produces a triggering signal every time the voltage on line **58** reaches a value corresponding to the passage of 100 gallons through weir **10**. The triggering signals count upwardly on the totalizer **25** to record the effluent flow in hundreds of gallons. Counter **26** is used to select the interval at which the samples are to be procured from the effluent, each interval corresponding to a predetermined number of gallons of effluent. It is set for this particular quantity in multiples or counts of 100 gallons, so that each signal developed by the amplifier **59** causes the counter **26** to count downwardly, when the switch **69** is closed, until its zero value is reached, at which time switch **70** closes momentarily to actuate the sampler **28** for an interval controlled by the setting of timer **75**.

The exact quantity of water that is diverted to the sample line **38** each time the solenoid **37–1** is energized will depend upon the interval it takes the switch **77** to reopen after each energization of the timer **75**. Thus, assuming that the specifications call for water samples to be taken every 3,000 gallons for 1–½ minutes, this would be accomplished by setting the counter **26** to a present count of 0030, and setting the timer **75** for a 90 second interval—i.e., switch **77** remains closed for 90 seconds each time relay coil **76** is energized, thus holding switch **77** closed for the same interval. Regardless of the selected sampling interval, however, the sampler **28** will always operate in proportion to the rate of flow of effluent through the weir **10**. For example, if the specifications required that, for an effluent flow rate of 1,000 gallons per minute, the sampler **28** have a turn-on time of 3 minutes at essentially full-duty cycle (1,000 gal. per minute), then as soon as the 3-minute sampler interval finished, the unit **28**, after the resetting of counter **26**, would immediately be turned on again to begin another 3 minute sample period. If, however, the flow rate were to drop to 500 gallons per minute, then the sampler **28** will operate at fifty percent duty cycle, which means that after the 3 minute sampling interval, a 3 minute power-off (solenoid **37–1** deenergized) period would occur before the sampler would again be turned on to collect a sample. The sampler duty cycle (ratio of on-time to on-time plus off-time) is thus controlled in proportion to the rate of flow of the effluent.

Although in the embodiment illustrated a capacitance level measuring probe **14** is employed in conjunction with the open weir, it will be apparent to one skilled in the art that the system is equally applicable to the measurement of water flow in a closed pipe or system in which a transducer or pressure responsive element could be employed for detecting changes in the rate of flow of the effluent, and for developing an output signal proportional thereto.

The transmitter **13** produces an output in a 4–20 milliamps range with zero set potentiometers for zero and full scale, and is calibrated to give 0–1 gallons/min. full scale or 0–10, 0–100 and 0–1000 gallons/min. full scale, depending upon selection of the weir or pipe **10**. Also, the 0 to 20 ma full scale output of the meter **22** can be calibrated in known manner to correspond to 0–5, 0–10, 0–20 or 0–75 gallons per minute merely by using properly marked dial plates in the meter. Multiples of 10 of these numbers are taken care of by the selection of the sluice or pipe, as noted above.

A further advantage of the sampling apparatus described herein is that, under normal operating conditions, the pump **32** operates at all times continuously to recirculate a quantity of water through the diverter valve **37**; and it is only upon receipt of an enabling signal from panel **18** that the valve **37** is energized long enough to divert a predetermined quantity of the flowing wastewater to the sample line **38**. Otherwise the pump recirculates wastewater through the outlet **41** and back into the weir **10**, so that there is no build-up of sediment in the sampling unit **28**. This also eliminates undesirable time lags between the triggering of the sampling unit **28** and the actual collection of the sample itself, thus giving extremely accurate measurements.

Having thus described our invention, what we claim is:

1. The method of sampling a flowing fluid, comprising

developing a first signal which varies in proportion to the rate of flow of a fluid past a station,

at intervals producing from said first signal a second signal representative of a predetermined quantity of fluid that has passed said station during the preceding interval,

recording said second signals,

momentarily developing a triggering signal each time a predetermined number of said second signals are recorded, and

automatically diverting part of said fluid for a predetermined time from said station to a sample collection station each time said triggering signal is developed.

2. The method as defined in claim 1, including

integrating said first signal in the intervals between said second signals to produce a third signal which increases in proportion with the quantity of fluid that passes said station, and

momentarily developing said second signal each time said third signal reaches a predetermined value.

3. The method of controlling a signal-responsive sampling device from a control station that is remote from a sampling station where said device is located, comprising

developing at said sampling station a first signal which is proportionate to the rate of flow of fluid past said sampling station,

transmitting said first signal to a control station remote from the sampling station,

integrating said first signal at said control station to produce a second signal each time a predetermined quantity of fluid has passed said sampling station,

recording said second signals at said control station, and

transmitting an enabling signal of predetermined duration from said control station to said sampling device to actuate said device for said duration each time a predetermined number of said second signals have been recorded at said control station.