



# DEVELOPMENT OF WASTEWATER TREATMENT PLANTS & RESOURCE RECOVERY PPP MODEL FROM INDIA

World Water Week, 2017

# PROGRAM BACKGROUND

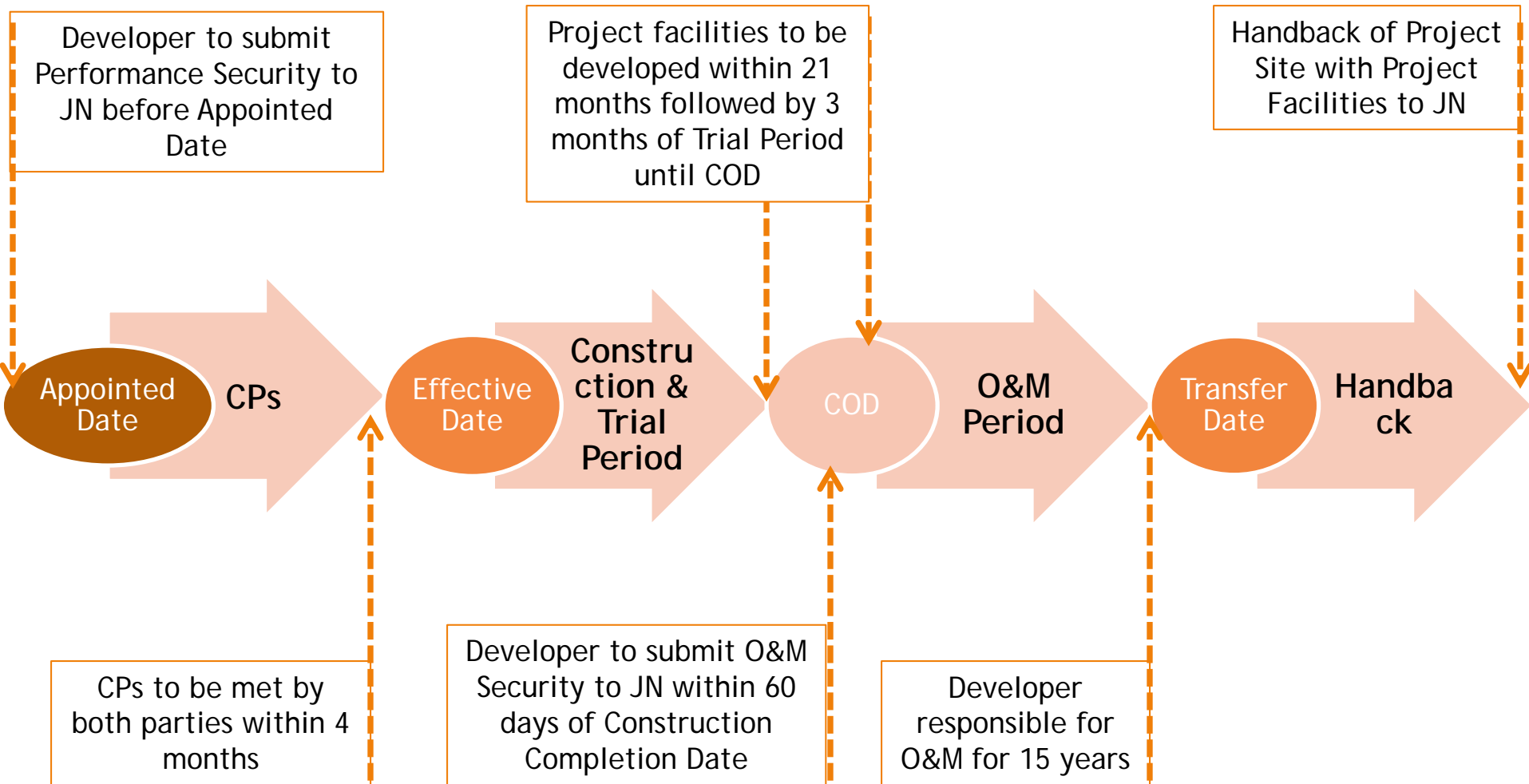
# Program Background

- In May 2015, Government of India (GOI) approved the flagship ***Namami Gange*** (revere the holy river Ganges) program for cleaning, rejuvenation and protection of the River Ganga -
  - Comprehensive multi-dimensional pollution abatement services across 118 towns & cities in Uttar Pradesh, Uttarkhand, West Bengal and Bihar
  - Allocation of a budget outlay of USD 3 billion for the program
- In January 2016, GOI approved a **“Hybrid Annuity PPP Model”** for the development of WWTPs in the Ganga basin under PPP
  - Concessionaire to mobilize 100% investment of which 40% will be reimbursed during construction and upon commissioning
  - 60% of the remaining capex will be paid in annuities during the concession period along with O&M expenditure
  - Payment security by setting up of a separate account
- Annual budgetary allocations being made accordingly to NMCG
- Several PPP projects envisaged under the program

# Program Background

- Subsequently in 2016, GOI issued the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016 (Ganga 2016 Order), applicable in all states in Ganga basin catchment, which:
  - Designates National Mission for Clean Ganga (NMCG) as a statutory authority under the Environment (Protection) Act, 1986
  - Appoints NMCG as the nodal agency for implementation of the Ganga 2016 Order
- Uttar Pradesh (UP) and Uttarakhand, in association with NMCG, have both selected Sewage Treatment Plant (STP) projects, to be developed under the Hybrid annuity Model.
- Hybrid-annuity based PPP projects launched in:
  - Haridwar for the development of two plants of 68 MLD at Jagjeetpur and 14 MLD at Sarai
  - Varanasi for the development of a 50 MLD STP at Ramana along with rehabilitation of pumping station, rising main, etc.
  - Mathura for the development of a 35 MLD STP and management of two existing STPs

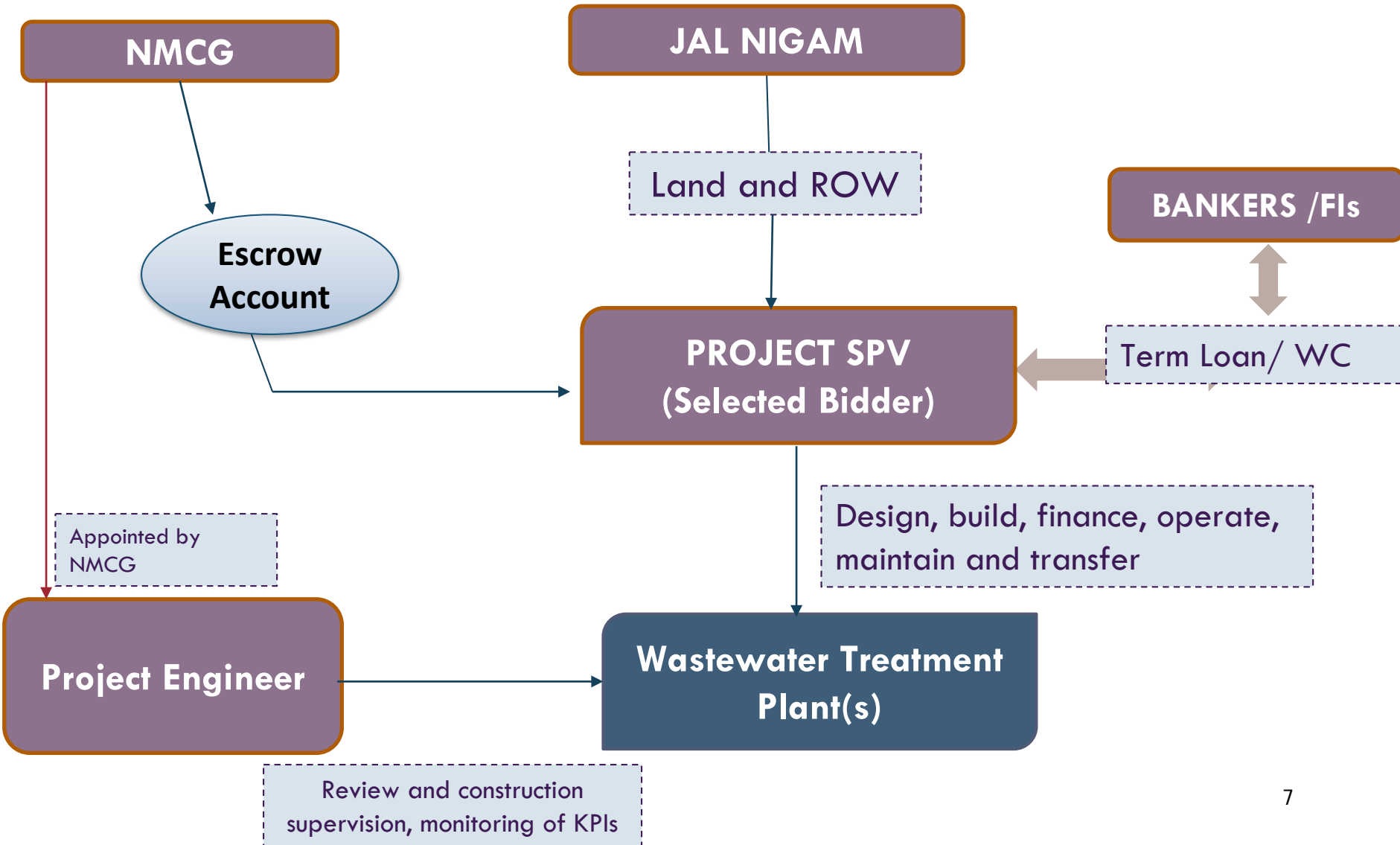
# Project Execution Timeframe



# KEY FEATURES OF THE TRANSACTION STRUCTURE

# Proposed Transaction Structure

Tripartite agreement to be executed between the Jal Nigam, NMCG and the identified private developer



# Payment Mechanism

## Construction linked payments

Payable, by COD, as certified by the Jal Nigam / NMCG, aggregating 40% of the Bid Project Cost quoted by the developer in its Financial Proposal

## Quarterly Payments – Capex Annuities, O&M Charges and Reimbursements

### Annuities

#### Capex Annuity

Capex annuity (EMI for balance 60% of the Bid Project Cost) paid out over 60 quarters of O&M Period + Interest on reducing balance of 60% of the Completion Cost

#### O&M Charges

O&M Charge, as quoted by Developer in its Financial Proposal, subject to compliance with KPIs and adjusted for LDs  
To be adjusted for O&M Price Index comprising 70% of CPI (W) and 30% of WPI

### Reimbursements

#### Power Charges

Paid on actuals to the Utility by the Concessionaire and reimbursed by NMCG subject to cap as per power units quoted in bid



# Key Performance Indicators

- **KPI 1** – Availability of the Facilities and the Associated Infrastructure during the O&M Period – should be 100% (95% during Scheduled Maintenance)
- **KPI 2** – Compliance of the Treated Effluent as per the requirements specified in the Concession Agreement

Parameter	Unit	Value
<b>pH</b>		6.5-9.0
<b>BOD<sub>5</sub> at 20°C</b>	mg/L	< 10
<b>TSS</b>	mg/L	< 10
<b>TN</b>	mg/L	< 10
<b>NH4-N</b>	mg/L	< 5
<b>COD</b>	mg/L	< 50
<b>TP</b>	mg/L	< 2
<b>Fecal Coliform</b>	MPN/100 mL	<100

- **KPI 3** - Compliance of the Digested Sludge as per the requirements specified in the Concession Agreement

Units	Digested Sludge Consistency
Outlet Concentration of dewatered sludge	More than 20% solids
Fecal Coliform Limit	Less than 20,00,000

## Bankability Perspective

1. Confirmed annuity payments from Budget support of GOI
2. Construction cost and O & M cost are index linked
3. Interest payment risk covered for annuities
4. Right to substitute the defaulting concessionaire by banks
5. Charge/lien on Escrow account and future annuity payments
6. Termination is related to continued non performance(3 events over a period of one year)
7. No penalties/ termination for not meeting the Key Performance Indicators) KPIs if there is variation in input volume and quality

# Bid Parameter

Bidders would be required to submit the financial proposal comprising

- Bid Project Cost
- O&M Charges for the first month after COD
- Guaranteed energy Consumption for each year of the O&M Period
- Land cost (loading only)

**Bid Price = Bid Project Cost + (O&M Charges x 180) + Power Charges + Land Price**

# RESOURCE RECOVERY

# Resource Recovery Provisions

- Biogas based power
  - Option available to the developer
  - Depends entirely on perceived viability – BOD levels, assured volumes, minimum economic size, power tariffs, incentives available, etc.
- Recycling and reuse of Treated Effluent
  - Option available to the developer
  - In Mathura, being built into the project scope – sale of Effluent to a large public sector refinery
  - Depends entirely on perceived viability – additional costs involved, off-take tariff, required quality
  - GOI incentivizing and encouraging resource recovery – e.g. mandatory for all power plants to procure Treated Effluent from WWTPs within 50 km.
- Needs a balance of a sustainable business model and incentives/subsidy from the Government

**Thank You**