



# SUI NORTHERN GAS PIPELINES LIMITED

GAS HOUSE, 21 KASHMIR ROAD, P.O. BOX 56, LAHORE (PAKISTAN)

Ref: RA-TPA-004-21

Date: February 19, 2021

Registrar,  
Oil and Gas Regulatory Authority,  
Fazal-e-Haq Road, ZTE Plaza,  
Blue Area,  
Islamabad.

Part-II

Dear Sir,

**Subject: Petition for Determination of Transportation Tariff of Transmission & Distribution System, FY 2020-21, in line with Rule 2(1)(cc), Rule 3(3), Schedule-I of TPA Rules and worked Examples in Article 25.6(a) And 25.6(b) of Pakistan Gas Network Code**

Please refer to OGRA's letter No. OGRA-10-3(5)/2021 dated January 20, 2021 and February 18, 2021 on the captioned subject wherein it has been directed to submit the certificate duly signed by Managing Director confirming that assets & T&D costs have been prudently segregated into Transmission & Distribution network categories and also in accordance with the decision of the Authority taken from time to time.

In this regard, as per direction of the Head (Finance-I), we are in process of revision of:

- Transportation tariff petition for FY 2020-21 in accordance with the Determination of Review of Estimated Revenue Requirement (RERR) FY 2020-21 dated February 10, 2021;
- Petition of Estimated Revenue Requirement FY 2021-22 segregated in Transmission, Distribution and Sales function.

As all the above information/data of the above mentioned petitions are interdependent, we may be able to provide the above mentioned certificate after finalizing the same.

Further to the above, it is also pertinent to mention here that the Authority has fixed the hearing of Petition of Final Revenue Requirement (FRR) for FY 2019-20 on February 26, 2021 and our team will also be engaged in preparation of the same.

Foregoing to the above it is requested to kindly accord extension for submission following revised petitions till March 10, 2021, which will also include the certificate mentioned above:

- Transportation tariff for FY 2020-21;
- Estimated Revenue Requirement FY 2021-22 segregated in Transmission, Distribution and Sales function.

Submitted please

SE-1 (Gas) - [Signature]  
HoD (F-I) - [Signature]  
cc: Head (Finance-I), OGRA



[Signature]  
(KAMRAN AKRAM)  
GENERAL MANAGER (RA)  
for MANAGING DIRECTOR

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# SUI NORTHERN GAS PIPELINES LIMITED

Reference: RA-TAR-21-22(P)-008

Date: February 17, 2021

Registrar,  
Oil and Gas Regulatory Authority,  
Fazal-e-Haq Road, ZTE Plaza,  
Blue Area,  
Islamabad.

Dear Sir,

**SUBJECT: SUI NORTHERN GAS PIPELINES LIMITED (SNGPL) - PETITION FOR DETERMINATION OF ESTIMATED REVENUE REQUIREMENTS FOR FY 2021-22**

This refers to our earlier letter No. RA-TAR-21-22(P)-004 dated 26.01.2021 on the captioned subject (copy enclosed), wherein an extension of 7 days from issuance of decision of Review of Estimated Revenue Requirement (RERR) for FY 2020-21 was requested to file the subject petition, segregated in terms of activities i.e. transmission, distribution and sale as per OGRA's direction so that tariff against each activity be ascertained.

In this regard, it is submitted that we are in process of compiling the petition based on OGRA's directions for which additional time is required.

In view of the above, the Authority is hereby requested to kindly grant extension for further 7 days to file the revised ERR for FY 2021-22 as per OGRA's directions.

With best regards.

A. Ghaffar  
(S. M. ABDUL GHAFOOR)  
Chief Officer (RA)  
Managing Director

Encl: As above

SED (Gas)  
Asst. Secy (FI)



No extension pl. be  
allowed.

Registrar

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c.c.; SED (Gas)

22-2-2021 at 5:00



# SUI NORTHERN GAS PIPELINES LIMITED

Reference: RA-TAR-21-22(P)-004

Date: January 26, 2021

Registrar,  
Oil and Gas Regulatory Authority,  
Fazal e Haq Road, Blue Area,  
Islamabad.

Dear Sir,

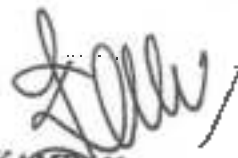
**SUBJECT: SUI NORTHERN GAS PIPELINES LIMITED (SNGPL) - PETITION FOR DETERMINATION OF ESTIMATED REVENUE REQUIREMENTS FOR FY 2021-22**

This refers to OGRA's letter No. OGRA-6(2)-1(4)/2020-ERR dated January 08, 2021 on the captioned subject, wherein it has been advised to submit the petition of ERR FY 2021-22 segregated in terms of activities i.e. transmission, distribution and sale so that tariff against each activity be ascertained.

In this regard, it is submitted that the company is already in process of filing of the revised petition of ERR FY-2021-22 based on the desired segregation in terms of activities and some new projects. Furthermore, it is highlighted that the determination of Review of Estimated Revenue Requirement (RERR) for FY 2020-21 is pending with the Authority, which will impact the opening balances for FY 2021-22.

In view of the above, it is requested to kindly grant extension for filing of revised petition of ERR FY 2021-22 within 7 days of receipt of decision of RERR FY 2020-21.

With best regards,

  
(KAMRAN AKRAM)  
General Manager (RA)  
for Managing Director



OGRA-6(2)-1(4)/2020-ERR

February 24, 2021

The Managing Director,  
Sui Northern Gas Pipelines Limited,  
21-Kashmir Road,  
**LAHORE.**

**Subject: SUI NORTHERN GAS PIPELINES LIMITED (SNGPL) - PETITION  
FOR DETERMINATION OF ESTIMATED REVENUE REQUIREMENTS  
FOR F.Y. 2021-22**

Dear Sir,

Please refer to your office letter No. RA-TPA-004-21 dated February 19, 2021 on the subject noted above.

2. Under Section 8(1) of the OGRA Ordinance, 2002 and Rule 4(2) of the NGTR, 2002, every licensee has to file its petition for determination of Estimated Revenue Requirement by first day of December each year, however SNGPL filed its instant petition 31-12-2020 with one month (30) days delay alongwith incomplete documentation.
3. Subsequently, as per advice of the concerned Dept. of OGRA, vide its letter dated 08 & 25-01-2021 advised SNGPL to submit the information stipulated in Clause 15.1 of Authority's determination dated 13-07-2020, so that proceedings for DERR F.Y. 2021-22 may be initiated, submitted before the Authority for admission and Public Hearing process. Further, Registrar Office after consultation with the concerned depts. numerous times telephonically advised SNGPL to submit the requisite data which is still awaited. This delay in non-filing of the subject petition is on the part of the utility company which hampers the entire Revenue Requirement process which carries potential regulatory risk and audit implications in future.
4. In view of above, request for further extension for submission of requisite data is not tenable. It is, therefore advised to submit the same without further delay, in order meet the timelines for issuance of the Authority's determination, please.

Best Regards,



(Dr. Abdul Basit Qureshi)  
Registrar  
(For & on behalf of the Authority)

o/c



# SUI NORTHERN GAS PIPELINES LIMITED

GAS HOUSE, 21 KASHMIR ROAD, P.O. BOX 56, LAHORE (PAKISTAN)

Reference: RA-TAR-21-22(P)-009

Date: March 1, 2021

Registrar,  
Oil and Gas Regulatory Authority,  
Fazal e Haq Road, Blue Area,  
Islamabad.



Dear Sir,

**Subject: Petition for Estimated Revenue Requirements (ERR) for FY 2021-22**

Further to our earlier letter No. RA-TAR-21-22(P)-002 dated December 31, 2020, wherein the Company has filed the Petition for Estimated Revenue Requirements for FY 2021-22. Furthermore, the Authority vide its letter No. OGRA-6(2)-1(4)/2020-ERR dated January 08, 2021 has advised the Company to submit the petition of ERR FY 2021-22 segregated in terms of activities i.e. transmission, distribution and sale so that tariff against each activity be ascertained.

Accordingly, the revised petition of ERR FY 2021-22 is being submitted on the following basis:

1. The petition has been segregated in terms of activities i.e. *'Transmission, Distribution and Sale'* as per the direction of the Authority.
2. Furthermore, the following projects have been included in the instant petition:
  - i) In order to develop in-house technical capacity building of Human Resource and training/knowledge on the equipment/machinery before undertaking North South Gas Pipelines Project (NSGPP), the Board of Directors (BOD) at its 556<sup>th</sup> meeting held on December 31, 2020 accorded approval for Construction of 56" dia X 260 meters transmission pipeline from AV31 (a) to Punjab Power plant V/A at total budgeted cost of Rs. 97 million. Keeping in view of the importance of the project, the Authority is requested to kindly approve the project in FY 2021-22.
  - ii) The SNGPL pipeline network is the largest pipeline system of Pakistan sprawling over very large franchise area that was in dire need of an efficient solution like Geographic Information System (GIS) for managing, monitoring and decision making of such complex network. Accordingly, on the advice of Ministry of Energy and BOD's directives, a comprehensive GIS mapping project has been planned and accordingly approved by BOD in its 556<sup>th</sup> meeting held on December 31, 2020. The project plan consist of two subsequent Phases (1A&1B and 2), with a total budgetary cost of Rs. 509.5 million. The cost of Phase-1(A) amounting to Rs. 213.72 million has been included in the instant petition. However, keeping in view of the importance of the project, the Authority is requested to kindly approve this project with total cost amounting to Rs. 509.5 million. The remaining cost will be included/claimed in the petitions of ERR/FRR of the relevant years accordingly.
  - iii) The BOD in its 566<sup>th</sup> meeting held on February 13, 2021, has according approval of Rs. 3,184 million for installation of Smart metering at 2,924 isolated TBSs, which are without meters and Rs. 161 million for installation of GPRS system at 616 metered TBSs. Keeping in view of the importance of the project, the Authority is requested to kindly approve this project in FY 2021-22.

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*Handwritten signatures and dates:*  
3/2/21  
3/2/21  
3/2/21



# SUI NORTHERN GAS PIPELINES LIMITED

GAS HOUSE, 21-KASHMIR ROAD, P.O. BOX 56, LAHORE (PAKISTAN)

The BOD approval alongwith the detailed agenda of aforementioned projects is being attached with the instant petition as *Annex-A*.

3. The opening assets of FY 2021-22 have been revised based on the Authority's decision against Company's KRRR FY 2020-21 dated February 10, 2021.
4. Accordingly, segment wise detail of shortfall alongwith requested increase the prescribed/sale prices in each category of consumers w.e.f. from July 01, 2021 is as under:

| Description                                                   | Amount<br>Rs. in Lakhs | Amount<br>Rs. per Annum |
|---------------------------------------------------------------|------------------------|-------------------------|
| Indigenous gas business for FY 2021-22                        | 71,199                 | 187.66                  |
| Indigenous gas business (Including Previous Years' Shortfall) | 325,307                | 857.40                  |
| RTNG business - Cost of Supply                                | 41,312                 | 137.47                  |

With best regards.

  
(KAMRAN AKRAM)  
General Manager (RA)  
As Managing Director

Encl: As Above

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**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR REVIEW OF ESTIMATED REVENUE REQUIREMENT**  
**FOR FY 2021-22**

| <b>ITEM</b> | <b>DESCRIPTION</b>                                           | <b>PAGE #</b> |
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| 1           | Form under Rule 4 of the Natural Gas Tariff Rules 2002       | 02            |
| 2           | Tariff Sheet (Function Wise)                                 | 06            |
| 3           | Tariff Sheet                                                 | 08            |
| 4           | Prescribed Prices Schedule                                   | 09            |
| 5           | Cost of Supply of RLNG                                       | 11            |
| 6           | Gas Sales Schedules                                          | 12            |
| 7           | Basis/Assumptions                                            | 31            |
| 8           | Cost of Gas Sales Schedules                                  | 32            |
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**SUI NORTHERN GAS PIPELINES LIMITED**  
**Petition for Estimated Revenue Requirements**  
**Financial Year 2021-22**

## Schedule I of Tariff Rules 2002

| APPLICATION FORM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Reference number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Date<br>March 01, 2021 |
| <b>Company Profiles</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |
| 1. Name of the Petitioner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |
| <ul style="list-style-type: none"> <li>Sui Northern Gas Pipelines Limited</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |
| 2. Full address of the Petitioner                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        |
| <ul style="list-style-type: none"> <li>21, Kashmir Road, Lahore 54000</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |
| 3. The grounds giving rise to the Petitioner's interest forming the basis of the Petition                                                                                                                                                                                                                                                                                                                                                                                                                      |                        |
| <ul style="list-style-type: none"> <li>Capital &amp; Revenue Budget estimates for the FY 2021-22</li> <li>Overhauling of 25 Nos. turbine engines (Centaur &amp; Saturn) and 9 Nos. gas compressor boosters w.e.f. FY 2021-22 to 2023-26</li> <li>GIS Mapping project of gas infrastructure</li> <li>Installation of smart metering at isolated THSs.</li> <li>Laying of 56" dia. x260 meters high pressure transmission pipeline segment.</li> <li>Revalidation of previous year's capital budgets.</li> </ul> |                        |
| 4. Number and details of the License                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |
| <ul style="list-style-type: none"> <li>License number NG 002/2003</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |
| <b>Transmission of Natural Gas</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                        |
| i. Construction and operation of pipelines for the purpose of transmission of natural gas; and                                                                                                                                                                                                                                                                                                                                                                                                                 |                        |
| ii. Transmission of natural gas through transmission system of the Licensee                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| <b>Distribution and Sale of Natural Gas</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |
| i. Construction and operation of pipelines for the purpose of distribution and sale of natural gas throughout the territories of Province of Punjab, North West Frontier Province (NWFP), Federal Capital, Federally Administered Tribal Area (FATA), Azad Jammu and Kashmir (AJK) and those areas of Province of Sindh where the Licensee operates natural gas distribution system prior to the date of issuance of the License and ;                                                                         |                        |
| ii. Distribution and sale of natural gas through the distribution system of the Licensee within its authorized area, with an exclusive right till 30 <sup>th</sup> June 2010 to distribute and sell natural gas to its existing consumers and such consumers as are connected to its distribution system on or before 30 <sup>th</sup> June 2005.                                                                                                                                                              |                        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. State, in concise manner, the grounds and facts forming the basis of the Petition and the relief or determination sought from the Authority.                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"><li>• Our projections for FY 2021-22 reflect an increase of Rs. 857.40 per MMBTU including previous years' shortfall (Rs. 187.66 per MMBTU for FY 2021-22 only) in normal business and Rs. 137.47 per MMBTU as cost of supply for RLNG business.</li></ul>                                                                                                                                                                 |
| 6. Summary of evidence giving brief particulars of the data, facts and evidence in support of the Petition.                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>• Statement showing revenue requirement calculation is attached along with supporting details.</li></ul>                                                                                                                                                                                                                                                                                                               |
| 7. Other Petitions filed with the Authority at the time of filing of this Petition and which directly and significantly of any material effect, the grant and denial of those Petitions will have on those other Petition are mentioned below:                                                                                                                                                                                                               |
| <ul style="list-style-type: none"><li>• Petition of Final Revenue Requirement (FRR) for FY 2019-20</li></ul>                                                                                                                                                                                                                                                                                                                                                 |
| 8. Petition to be accompanied by details of the following market data:                                                                                                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"><li>➤ Number and consumption details of consumers likely to be affected by the Petition.</li><li>➤ If the Petitioner is a licensee, an estimate of the volume of natural gas to be transmitted, distributed and sold.</li><li>➤ The Petitioner's total annual peak day natural gas requirement; and</li><li>➤ The Petitioner's forecast of yearly capital expenditure for five years including year under review</li></ul> |

Lahore, March 01, 2021

  
(KAMRAN AKRAM)  
General Manager (RA)  
for Managing Director

## Forecast of yearly capital expenditure

|                             | 2021-22       | 2022-23       | 2023-24       | 2024-25       | 2025-26       |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|
| LAND FREIGHT                | 3             | 35            | 40            | 42            | 42            |
| BUILDING ON FREIGHT LAND    | 300           | 100           | 100           | 105           | 105           |
| TRANSMISSION MAINS          | 1,918         | 3,100         | 3,500         | 3,700         | 3,900         |
| DISTRIBUTION MAINS          | 69,354        | 32,000        | 33,000        | 33,000        | 33,000        |
| COMPRESSORS STATION EQUIP.  | 576           | 481           | 685           | 567           | 725           |
| TELECOMMUNICATION EQUIPMENT | 44            | 15            | 17            | 18            | 18            |
| PLANT AND MACHINERY         | 1,322         | 1100          | 1,250         | 1,315         | 1,380         |
| MEASURING AND REGULATING    | 15,687        | 7,500         | 8,000         | 8,500         | 9,000         |
| TOOLS AND EQUIPMENT         | 42            | 250           | 280           | 294           | 300           |
| MOTOR VEHICLES              | 224           | 300           | 325           | 341           | 360           |
| CONSTRUCTION EQUIPMENT      | 551           | 200           | 220           | 231           | 243           |
| FURNITURE & FIXTURES        | 74            | 50            | 55            | 58            | 61            |
| OFFICE EQUIPMENTS           | 41            | 50            | 50            | 53            | 56            |
| COMPUTER HARDWARE           | 420           | 200           | 220           | 231           | 243           |
| COMPUTER SOFTWARE SYSTEM    | 106           | 100           | 110           | 116           | 123           |
| SCADA SYSTEM                | 1             | -             | -             | -             | -             |
| <b>Total</b>                | <b>90,663</b> | <b>45,481</b> | <b>47,852</b> | <b>48,569</b> | <b>49,556</b> |

### Consumers

| Category of consumers | No.        | Total            |
|-----------------------|------------|------------------|
| Industrial            | No.        | 7,686            |
| Commercial            | No.        | 72,763           |
| Domestic              | No.        | 8,871,198        |
|                       | <b>No.</b> | <b>8,951,647</b> |

## AFFIDAVIT

I hereby certify and declare that the information given in the Petition for Estimated Revenue Requirements FY 2021-22 is correct and complete in all respects to the best of my knowledge.

---

(KAMRAN AKRAM)  
General Manager (RA)  
Managing Director

Lahore, March 1, 2021

SUN NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2022-23

[TS] - TARIFF CALCULATION SHEET (FUNCTION WISE)

| Particulars                                          | TRANSMISSION    |                 |                 | DISTRIBUTION    |                 |                 | SALES           |                 |                 |
|------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                                      | Indigenous      | RLNG            | Total           | Indigenous      | RLNG            | Total           | Indigenous      | RLNG            | Total           |
| <b>1 Gas Sales</b>                                   |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 1A Sales Volume (MMSCF)                              | -               | -               | -               | -               | -               | -               | 395,177         | 284,861         | 680,037         |
| 1B Sales Volume (BSCU)                               | -               | -               | -               | -               | -               | -               | 379,409         | 300,578         | 679,987         |
| 1C Calorific Value                                   | -               | -               | -               | -               | -               | -               | 960.10          | 1,055.00        | -               |
| <b>(Rupees in Millions)</b>                          |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| <b>2 Net Operating Revenue</b>                       |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| Sales at Sale Price                                  | -               | -               | -               | -               | -               | -               | 211,900         | -               | 211,900         |
| Rental and Service Charges                           | -               | -               | -               | -               | -               | -               | 4,100           | -               | 4,100           |
| Surcharge & Interest on Gas Sales Arrears (LPS)      | -               | -               | -               | -               | -               | -               | 9,348           | -               | 9,348           |
| Amortisation of Deferred Credit                      | 240             | 682             | 922             | 3,660           | 603             | 4,263           | 3,660           | 303             | 4,063           |
| Other Operating Income                               | -               | -               | -               | -               | -               | -               | 1,894           | -               | 1,894           |
| <b>2A Total Income</b>                               | <b>280</b>      | <b>682</b>      | <b>962</b>      | <b>3,660</b>    | <b>603</b>      | <b>4,263</b>    | <b>230,402</b>  | <b>603</b>      | <b>231,005</b>  |
| <b>Less: Expenses</b>                                |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| Cost of Gas                                          | -               | -               | -               | -               | -               | -               | 191,172         | -               | 191,172         |
| UFG disallowance                                     | -               | -               | -               | -               | -               | -               | (750)           | -               | (750)           |
| IRR Cost (Net off Capital Allocation)                | 3,123           | 2,473           | 5,596           | 8,490           | 6,717           | 15,197          | 13,589          | 10,764          | 24,352          |
| Operating Cost (Net off Capital Allocation)          | 2,150           | 1,703           | 3,852           | 5,734           | 3,491           | 9,224           | 8,852           | 5,239           | 14,091          |
| Gas Internally Consumed (Net off Capital Allocation) | 1,285           | 6,675           | 7,960           | 1,285           | 6,675           | 7,960           | 1,285           | 6,675           | 7,960           |
| Depreciation                                         | 5,205           | 2,696           | 7,901           | 24,502          | 3,959           | 28,461          | 24,873          | 3,939           | 28,812          |
| Transportation charges payable to SSCC               | -               | 7,117           | 7,117           | -               | 7,117           | 7,117           | -               | 7,117           | 7,117           |
| Finance cost on LMS financing                        | -               | -               | -               | -               | -               | -               | -               | -               | -               |
| Late Payment Surcharge (Payable)                     | -               | -               | -               | -               | -               | -               | 25,778          | -               | 25,778          |
| Finance cost for Working capital                     | -               | -               | -               | -               | -               | -               | 875             | 1,764           | 2,639           |
| Regional Office at Karak (Sub area and CSCs)         | -               | -               | -               | 90              | -               | 90              | 90              | -               | 90              |
| Operating expense of GIS Mapping project             | -               | -               | -               | 105             | -               | 105             | 105             | -               | 105             |
| WPPF                                                 | -               | -               | -               | -               | -               | -               | 853             | 230             | 1,083           |
| <b>2B Total Expenses</b>                             | <b>11,762</b>   | <b>21,654</b>   | <b>33,416</b>   | <b>40,256</b>   | <b>27,939</b>   | <b>68,195</b>   | <b>276,722</b>  | <b>35,750</b>   | <b>312,472</b>  |
| <b>2C Return obtainable (2A - 2B)</b>                | <b>(11,483)</b> | <b>(20,972)</b> | <b>(32,454)</b> | <b>(36,596)</b> | <b>(27,136)</b> | <b>(63,732)</b> | <b>(45,820)</b> | <b>(34,947)</b> | <b>(80,767)</b> |

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SUN NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[TS] - TARIFF CALCULATION SHEET (FUNCTION WISE)

| Particulars                                                                                                     | TRANSMISSION |        |        | DISTRIBUTION |        |         | SALES      |        |         |
|-----------------------------------------------------------------------------------------------------------------|--------------|--------|--------|--------------|--------|---------|------------|--------|---------|
|                                                                                                                 | Indigenous   | RLNG   | Total  | Indigenous   | RLNG   | Total   | Indigenous | RLNG   | Total   |
| 3 Required Return on Net Fixed Assets                                                                           |              |        |        |              |        |         |            |        |         |
| Net Operating Fixed Assets at Beginning                                                                         |              |        |        |              |        |         |            |        |         |
| Net Operating Fixed Assets at End                                                                               |              |        |        |              |        |         |            |        |         |
| 3A AVERAGE NET ASSETS                                                                                           | 20,109       | 45,762 | 65,871 | 133,229      | 48,072 | 181,301 | 139,562    | 48,072 | 187,633 |
|                                                                                                                 | 17,928       | 42,173 | 60,101 | 195,658      | 46,431 | 242,089 | 197,032    | 46,431 | 243,463 |
|                                                                                                                 | 19,019       | 43,967 | 62,986 | 164,949      | 47,251 | 212,200 | 165,296    | 47,252 | 212,548 |
| Deferred Credit Opening                                                                                         |              |        |        |              |        |         |            |        |         |
| Deferred Credit Closing                                                                                         | 1,832        | 8,760  | 10,592 | 20,480       | 10,291 | 30,761  | 20,480     | 10,281 | 30,761  |
| 3B AVERAGE DEFERRED CREDIT                                                                                      | 1,998        | 9,282  | 11,280 | 20,419       | 11,081 | 31,500  | 20,819     | 11,181 | 32,000  |
|                                                                                                                 | 3,910        | 9,020  | 12,930 | 20,630       | 10,731 | 31,360  | 20,650     | 10,731 | 31,380  |
| 3C Average Net Operating Fixed Assets (3A - 3B)                                                                 | 17,109       | 34,947 | 52,056 | 144,299      | 36,520 | 180,819 | 144,647    | 36,921 | 181,567 |
| 3D Required Return on Net Assets - in Percentage                                                                | 17.43%       | 17.43% | 17.43% | 17.43%       | 17.43% | 17.43%  | 17.43%     | 17.43% | 17.43%  |
| 3E Required Return (3C x 3D)                                                                                    | 2,982        | 6,091  | 9,073  | 25,151       | 6,365  | 31,517  | 25,212     | 6,366  | 31,577  |
| 4 [Surplus] / Shortfall for FY 2021-22/RLNG cost of supply (Gross Opex)                                         | 14,465       | 27,063 | 41,528 | 61,747       | 33,521 | 95,268  | 71,032     | 41,312 | 112,344 |
| 5 Additional Revenue Requirement for LPG Air mix Projects                                                       | -            | -      | -      | 167          | -      | 167     | 167        | -      | 167     |
| 6 [Surplus] / Shortfall for FY 2021-22/RLNG cost of supply                                                      | 24,465       | 27,063 | 41,528 | 61,914       | 33,521 | 95,435  | 71,199     | 41,312 | 112,511 |
| Increase/(decrease) in Prescribed Prices for FY 2021-22/without shortfall pertains to previous years)           | -            | -      | -      | -            | -      | -       | 187,66     | 137.47 | 165.47  |
| 7(a) Shortfall upto FY 2017-18                                                                                  | -            | -      | -      | -            | -      | -       | 112,177    | -      | 112,177 |
| 7(b) Shortfall of FY 2018-19                                                                                    | -            | -      | -      | -            | -      | -       | 44,915     | -      | 44,915  |
| 7(c) Shortfall of FY 2019-20 (As per FRM FY 2019-20)                                                            | -            | -      | -      | -            | -      | -       | 82,664     | -      | 82,664  |
| 7(d) Shortfall of FY 2021-22 (As per DRFR FY 20-21)                                                             | -            | -      | -      | -            | -      | -       | 4,351      | -      | 4,352   |
| 7 Total Cumulative Previous Year Shortfall upto FY 2020-21                                                      | -            | -      | -      | -            | -      | -       | 250,108    | -      | 250,108 |
| 8 Cumulative (Surplus)/ Shortfall/RLNG cost of supply                                                           | 14,465       | 27,063 | 41,528 | 61,914       | 33,521 | 95,435  | 325,307    | 41,312 | 366,619 |
| 9 Increase / (decrease) in Prices /Cost of Supply of RLNG (inclusive of shortfall pertaining to previous years) | -            | -      | -      | -            | -      | -       | -          | -      | -       |
| 10 Impact of RLNG Diverted towards System Gas Consumers to be charged to RLNG Consumers                         | -            | -      | -      | -            | -      | -       | 857.40     | 137.47 | 994.87  |

Notes:

- 1) Minimum discountance / penalty under rule 28 of Natural Gas Licensing Rules is Rs 250 million.
- 2) The operating cost has been allocated to RLNG and Indigenous Business on the basis of sales volume.

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(TS) - TARIFF CALCULATION SHEET

| Particulars                                                                                                      | Reference | Paid/Not Paid to<br>Normal Consumers<br>(2.7.4 per Regulator's<br>Order) | Reference | Paid/Not Paid to<br>LNG Consumers |
|------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------|-----------|-----------------------------------|
| 1 Gas Sales                                                                                                      |           |                                                                          |           |                                   |
| 1A Sales Volume (MMCF)                                                                                           | 4         | 395,177                                                                  |           | 284,261                           |
| 1B Sales Volume (BSCU)                                                                                           | 4         | 179,403                                                                  | 1         | 300,528                           |
| 1C Calorific Value                                                                                               |           | 981.10                                                                   |           | 1,056                             |
| 2 Net Operating Revenue                                                                                          |           |                                                                          |           |                                   |
| Sales & Sale Price                                                                                               |           |                                                                          |           |                                   |
| Rental and Service Charges                                                                                       | 2         | 231,900                                                                  |           | -                                 |
| Surcharge @ Interest on Gas Sales Arrears (LPS)                                                                  |           | 4,100                                                                    |           | -                                 |
| Amortization of Deferred Credit                                                                                  |           | 5,348                                                                    |           | -                                 |
| Other Operating Income                                                                                           | 8         | 3,690                                                                    | 8         | 803                               |
| 2A Total Income                                                                                                  |           | 1,834                                                                    |           | -                                 |
|                                                                                                                  |           | 231,902                                                                  |           | 803                               |
| Less: Expenses                                                                                                   |           |                                                                          |           |                                   |
| Cost of Gas                                                                                                      | 4         | 191,172                                                                  |           | -                                 |
| LPG disallowance                                                                                                 |           | (750)                                                                    |           | -                                 |
| HR Cost (Net of Capital Allocation)                                                                              | 3         | 13,583                                                                   | 3         | 10,754                            |
| Operating Cost (Net of Capital Allocation)                                                                       | 3         | 8,852                                                                    | 3         | 5,234                             |
| Gas Intensity Consumed (Net of Capital Allocation)                                                               | 3         | 1,285                                                                    | 3         | 6,675                             |
| Depreciation                                                                                                     | 7.1       | 24,871                                                                   | 7.2       | 3,959                             |
| Transportation charges payable to SSC                                                                            |           | -                                                                        |           | 7,117                             |
| Law Payment Surcharge (Payable)                                                                                  |           | 35,774                                                                   |           | -                                 |
| Financial cost for Working capital                                                                               |           | 875                                                                      | 8         | 1,766                             |
| Regional Office at Kathi (Sub area and CSCs)                                                                     |           | 90                                                                       |           | -                                 |
| Operating expense of GIS Mapping project                                                                         |           | 106                                                                      |           | -                                 |
| WTF                                                                                                              |           | 839                                                                      |           | 230                               |
| 2B Total Expenses                                                                                                |           | 270,722                                                                  |           | 35,750                            |
| 2C Return obtainable (2A - 2B)                                                                                   |           | (41,820)                                                                 |           | (14,947)                          |
| 3 Required Return on Net Fixed Assets                                                                            |           |                                                                          |           |                                   |
| Net Operating Fixed Assets at Beginning                                                                          | 7.1       | 133,361                                                                  | 7.2       | 48,072                            |
| Net Operating Fixed Assets at End                                                                                | 7.1       | 137,082                                                                  | 7.2       | 46,481                            |
| 3A Average Net Assets                                                                                            |           | 165,296                                                                  |           | 47,252                            |
| Deferred Credit Opening                                                                                          | 8         | 20,140                                                                   | 8         | 10,281                            |
| Deferred Credit Closing                                                                                          | 8         | 20,819                                                                   | 8         | 11,193                            |
| 3B Average Deferred Credit                                                                                       |           | 20,650                                                                   |           | 10,737                            |
| 3C Average Net Operating Fixed Assets (3A - 3B)                                                                  |           | 144,647                                                                  |           | 35,521                            |
| 3D Required Return on Net Assets - In Percentage                                                                 |           | 17.40%                                                                   |           | 17.43%                            |
| 3E Required Return (3C x 3D)                                                                                     |           | 25,212                                                                   |           | 6,366                             |
| 4 (Surplus) / Shortfall for FY 2021-22/RLNG cost of supply (Gas Operations)                                      |           | 71,032                                                                   |           | 41,382                            |
| 5 Additional Revenue Requirement for LNG Air Lift Projects                                                       |           | 167                                                                      |           | -                                 |
| 6 (Surplus) / Shortfall for FY 2021-22/RLNG cost of supply                                                       |           | 71,199                                                                   |           | 41,382                            |
| Increased/decreased in Prescribed Prices for FY 2021-22 (without shortfall pertains to previous years)           |           | 187.66                                                                   |           | 137.47                            |
| 7(a) Shortfall upto FY 2017-18 (As per Accounts)                                                                 |           | 122,177                                                                  |           | -                                 |
| 7(b) Shortfall of FY 2018-19 (As per Motion for Review Impact CRR FY 2018-19)                                    |           | 44,925                                                                   |           | -                                 |
| 7(c) Shortfall of FY 2019-20 (As per FY 2019-20)                                                                 |           | 52,664                                                                   |           | -                                 |
| 7(d) Shortfall of FY 2021-22 (As per RRR FY 20-21)                                                               |           | 4,357                                                                    |           | -                                 |
| 7 Total Cumulative Previous Year Shortfall upto FY 2020-21                                                       |           | 254,103                                                                  |           | -                                 |
| 8 Cumulative (Surplus)/ Shortfall/RLNG cost of supply                                                            |           | 325,907                                                                  |           | 41,382                            |
| 9 Increase / (decrease) in Prices / Cost of Supply of RLNG (inclusive of shortfall pertaining to previous years) |           | 857.40                                                                   |           | 137.47                            |
| 10 Impact of RLNG Diverted towards System Gas Consumers to be charged to RLNG Consumers                          |           |                                                                          |           | 63,046                            |

Notes:

- 1) Maximum disallowance / penalty under rule 25 of Natural Gas Licensing Rules is Rs 750 million.
- 2) The operating cost has been allocated to RLNG and Indigenously produced gas on the basis of sales volume.

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**SLE NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

[PP] - ESTIMATED AND SUGGESTED PRESCRIBED PRICES [AS PER RULE 2(6)(b)]

| Description                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Current Prescribed Price<br>(As per GSA's notification<br>dated 23.08.2020) | Revised Average Prescribed<br>Prices<br>(w.e.f. July 01, 2021) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>1 Domestic Consumers</b>                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                             |                                                                |
| <b>A STAND ALONE METERS</b>                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                             |                                                                |
| <b>a</b> <u>residences, churches, temples, madonnas, other religious places and hotels attached</u><br><u>shanty</u>                                                                                                                                                                                                                                                                                                             |  |                                                                             |                                                                |
| Up to 50 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                  |  | 121.00                                                                      | 1,415.90                                                       |
| Up to 100 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 305.00                                                                      | 1,415.90                                                       |
| Up to 200 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 559.00                                                                      | 1,415.90                                                       |
| Up to 300 Cubic Meters per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 738.00                                                                      | 1,415.90                                                       |
| Up to 400 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 1,107.00                                                                    | 1,415.90                                                       |
| Over 400 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                  |  | 1,450.00                                                                    | 1,415.90                                                       |
| <b>b</b> <u>Government and non-Government offices, hospitals, Clinics, maternity homes,</u><br><u>Government police houses, Armed Forces messes and bungalows, universities, colleges,</u><br><u>schools, private educational institutions, orphanages and other charitable</u><br><u>institutions along with Havelis and Residential Colonies to whom Gas is supplied through</u><br><u>bulk meters including captive power</u> |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 781.00                                                                      | 1,415.90                                                       |
| <b>2 COMMERCIAL CONSUMERS</b>                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                             |                                                                |
| <u>All establishments registered as commercial units with local authorities or dealing in</u><br><u>consumer items for direct commercial sale like cafes, milk shops, tea stalls, confection</u><br><u>beverage shops, dairies, restaurants, places of entertainment like casinos, clubs and</u><br><u>theatres, private offices, corporate houses etc.</u>                                                                      |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 1,383.00                                                                    | 1,415.90                                                       |
| <b>3 Special Commercial Consumer (Rajl Tanpore)</b>                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                             |                                                                |
| Up to 50 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                  |  | 110.00                                                                      | 1,415.90                                                       |
| Up to 100 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 110.00                                                                      | 1,415.90                                                       |
| Up to 200 Cubic Meters Per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 701.00                                                                      | 1,415.90                                                       |
| Up to 300 Cubic Meters per Month                                                                                                                                                                                                                                                                                                                                                                                                 |  | 120.00                                                                      | 1,415.90                                                       |
| Over 300 Cubic Meters per month                                                                                                                                                                                                                                                                                                                                                                                                  |  | 700.00                                                                      | 1,415.90                                                       |
| <b>4 Ice Factories</b>                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 1,783.00                                                                    | 1,415.90                                                       |
| <b>5 Thermal Industrial Consumers</b>                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                             |                                                                |
| <u>All consumers engaged in the processing of industrial raw material into value added</u><br><u>finished products irrespective of the volume of gas consumed including hotel industry</u><br><u>but excluding such industries for which a separate rate has been prescribed.</u>                                                                                                                                                |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 1,054.00                                                                    | 1,415.90                                                       |
| <b>6 Zero Rated Consumers (Industrial &amp; Captive)</b>                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 813.00                                                                      | 1,415.90                                                       |
| <b>7 CNG Stations</b>                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                             |                                                                |
| Regional All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                           |  | 1,272.00                                                                    | 1,415.90                                                       |
| Regional All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                           |  | 1,415.00                                                                    | 1,415.90                                                       |
| <b>8 Canned Factories</b>                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                             |                                                                |
| All off-takes at flat rate of                                                                                                                                                                                                                                                                                                                                                                                                    |  | 1,177.00                                                                    | 1,415.90                                                       |

**SRI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

(PH) - ESTIMATED AND DISCOUNTED PRESCRIBED PRICES (AS PER RULE 4(2))

| Description                                                                                                                                 | Revenue per MMBtu                                                              |                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------|
|                                                                                                                                             | Current Prescribed Prices<br>(As per Gas Act Notification<br>dated 25.10.2020) | Revised Prescribed<br>Prices<br>(As per July 06, 2021) |
| <b>9 Fertilizer Factories</b>                                                                                                               |                                                                                |                                                        |
| Feed stock: All off takes at flat rate of                                                                                                   | 207.00                                                                         | 1,415.00                                               |
| Gas used for Feed for Electricity Generation, steam and heating colonies                                                                    |                                                                                |                                                        |
| (a) Pak-American Fertilizer (Limited, Dhawdhaw)                                                                                             |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,021.00                                                                       | 1,415.00                                               |
| (b) Pakistan Fertilizer Limited, (Fakir)                                                                                                    |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,021.00                                                                       | 1,415.00                                               |
| (c) Dawood Hercules Chemicals Limited, Chittabul Bazar, Shahjahanpur District                                                               |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,021.00                                                                       | 1,415.00                                               |
| (d) Pak-China Fertilizer Limited/ Hamara Phosphate Plant Limited, Hattapur                                                                  |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,021.00                                                                       | 1,415.00                                               |
| (e) Agro Fertilizer Company Limited                                                                                                         |                                                                                |                                                        |
| Feed stock: All off takes at flat rate of                                                                                                   | \$3.70                                                                         | 2,415.00                                               |
| Gas used for Feed for Electricity Generation, steam and heating colonies                                                                    | 1,021.00                                                                       | 1,415.00                                               |
| <b>10 POWER STATIONS</b>                                                                                                                    |                                                                                |                                                        |
| (a) WAPDA's Power Stations and other electricity utility companies including WAPDA's<br>Natural Gas Turbine Station, Multanabad, Faisalabad |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 857.00                                                                         | 1,415.00                                               |
| (b) WAPDA's Natural Gas Turbine Station, Multanabad, Faisalabad                                                                             |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 857.00                                                                         | 1,415.00                                               |
| Fixed Charge (Rupee per month)                                                                                                              | 390,000                                                                        | 390,000                                                |
| (c) (Electric Power Limited)                                                                                                                |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,111.00                                                                       | 1,415.00                                               |
| <b>10 Composite Power</b>                                                                                                                   |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 1,087.00                                                                       | 1,415.00                                               |
| <b>11 Independent Power Projects</b>                                                                                                        |                                                                                |                                                        |
| All off takes at flat rate of                                                                                                               | 817.00                                                                         | 1,415.00                                               |

SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

130

[1] - COST OF SUPPLY RLNG TO BE TAKEN IN MONTHLY RLNG PRICE DETERMINATIONS

| Particulars                                                                                                                | Amount                       |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Quantitative Data</b>                                                                                                   | <b>BBTU</b>                  |
| RLNG Input                                                                                                                 | 392,333                      |
| Retainage / gas used in PSRU @ 0.75%                                                                                       | (2,946)                      |
| GIC - SSGCL network @ 0.5%                                                                                                 | (1,964)                      |
| GIC - SNGPL network @ 1.2%                                                                                                 | (4,714)                      |
| UFG @ 4.69%                                                                                                                | (18,424)                     |
| RLNG Diverted to System Gas Consumers                                                                                      | (64,257)                     |
| <b>Net RLNG sold</b>                                                                                                       | <b>300,528</b>               |
| <b>Cost Components</b>                                                                                                     | <b>Million Rs.</b>           |
| Amortization of Deferred Credit                                                                                            | (803)                        |
| Depreciation                                                                                                               | 3,950                        |
| Return on Assets                                                                                                           | 6,366                        |
| HR and other relevant costs allocated to RLNG                                                                              | 16,002                       |
| Gas Internally Consumed SNGPL                                                                                              | 6,675                        |
| Transportation charges payable to SSGC                                                                                     | 7,117                        |
| Finance cost for working capital                                                                                           | 1,766                        |
| WPPF                                                                                                                       | 230                          |
| <b>Total</b>                                                                                                               | <b>41,312</b>                |
| <b>Rs/ MMBTU</b>                                                                                                           | <b>137.47</b>                |
| <b>Diversion of RLNG towards indigenous Gas Consumer</b>                                                                   |                              |
| RLNG to be Sold as System Gas                                                                                              | MMCF 60,907                  |
|                                                                                                                            | BBTU 64,257                  |
| Cost of RLNG Sold as System Gas @ avg cost of RLNG Purchased i.e. Rs. 1416/MMBTU (A)                                       | Rs. in Million 90,985        |
| Cost of RLNG Sold as System Gas booked in Indigenous gas @ avg sale price of Commercial and Domestic i.e. 436.12/MMBTU (B) | Rs. in Million 27,940        |
| <b>Impact of Diversion of RLNG to Indigenous Gas concerns to be charged to RLNG consumer (A-B)</b>                         | <b>Rs. in Million 63,046</b> |
| <b>Impact of Diversion of RLNG to Indigenous Gas concerns to be charged to RLNG consumer</b>                               | <b>Rs./MMBTU 209.78</b>      |
| <b>Cost of RLNG purchased (\$/MMBTU)</b>                                                                                   | <b>8.45</b>                  |
| <b>Cost of RLNG purchased (Rs/MMBTU)</b>                                                                                   | <b>1,415.95</b>              |

**Assumptions:**

1. Input volume has been taken as 1020 MMCFD at GCV of 1055 BTU/SCF.
2. Retainage has been assumed @0.75% of RLNG Input.
3. GIC has been assumed as 1.70% of RLNG input (1.2% in SNGPL network while 0.5% in SSGC network).
4. Avg. UFG %age has been assumed as 4.69% of RLNG Input based on the actual data of FY 2019-20.
5. GIC has been valued at the average purchase price of Rs. 1,416/MMBTU, assuming brant price @ \$55/bbl and slope as 13.37% plus additional port charges as \$0.10/MMBTU while other cost on account of custom duty, regasification charges and retainage @ \$1/MMBTU has been taken.
6. GIC in SSGC network is included in the transportation charges, payable to SSGC.

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1. **QUESTION**

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החברה מייבאת ומשווקת את כל סוגי המכשירים הנ"ל, וכן  
מספקת שירותי תחזוקה, אבחון וטיפול במכשירים.  
החברה ממוקמת ברחוב גורן 10, תל אביב 6109101.

TECHNICAL MANUAL AND CONSTRUCTION - 11

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**THE UNIVERSITY OF CHICAGO**

1. "GIVE US THE RUM" - L. J. R. 1913

**Appendix 1**

| DATE | TIME | LOCATION | WIND | TEMP | REL HUM | SEA | WAVE | WAVE DIR | WAVE PER | WAVE HGT | WAVE L | WAVE W | WAVE S | WAVE T | WAVE F | WAVE C | WAVE D | WAVE E | WAVE G | WAVE H | WAVE I | WAVE J | WAVE K | WAVE L | WAVE M | WAVE N | WAVE O | WAVE P | WAVE Q | WAVE R | WAVE S | WAVE T | WAVE U | WAVE V | WAVE W | WAVE X | WAVE Y | WAVE Z | WAVE AA | WAVE AB | WAVE AC | WAVE AD | WAVE AE | WAVE AF | WAVE AG | WAVE AH | WAVE AI | WAVE AJ | WAVE AK | WAVE AL | WAVE AM | WAVE AN | WAVE AO | WAVE AP | WAVE AQ | WAVE AR | WAVE AS | WAVE AT | WAVE AU | WAVE AV | WAVE AW | WAVE AX | WAVE AY | WAVE AZ | WAVE BA | WAVE BB | WAVE BC | WAVE BD | WAVE BE | WAVE BF | WAVE BG | WAVE BH | WAVE BI | WAVE BJ | WAVE BK | WAVE BL | WAVE BM | WAVE BN | WAVE BO | WAVE BP | WAVE BQ | WAVE BR | WAVE BS | WAVE BT | WAVE BU | WAVE BV | WAVE BW | WAVE BX | WAVE BY | WAVE BZ | WAVE CA | WAVE CB | WAVE CC | WAVE CD | WAVE CE | WAVE CF | WAVE CG | WAVE CH | WAVE CI | WAVE CJ | WAVE CK | WAVE CL | WAVE CM | WAVE CN | WAVE CO | WAVE CP | WAVE CQ | WAVE CR | WAVE CS | WAVE CT | WAVE CU | WAVE CV | WAVE CW | WAVE CX | WAVE CY | WAVE CZ | WAVE DA | WAVE DB | WAVE DC | WAVE DD | WAVE DE | WAVE DF | WAVE DG | WAVE DH | WAVE DI | WAVE DJ | WAVE DK | WAVE DL | WAVE DM | WAVE DN | WAVE DO | WAVE DP | WAVE DQ | WAVE DR | WAVE DS | WAVE DT | WAVE DU | WAVE DV | WAVE DW | WAVE DX | WAVE DY | WAVE DZ | WAVE EA | WAVE EB | WAVE EC | WAVE ED | WAVE EE | WAVE EF | WAVE EG | WAVE EH | WAVE EI | WAVE EJ | WAVE EK | WAVE EL | WAVE EM | WAVE EN | WAVE EO | WAVE EP | WAVE EQ | WAVE ER | WAVE ES | WAVE ET | WAVE EU | WAVE EV | WAVE EW | WAVE EX | WAVE EY | WAVE EZ | WAVE FA | WAVE FB | WAVE FC | WAVE FD | WAVE FE | WAVE FF | WAVE FG | WAVE FH | WAVE FI | WAVE FJ | WAVE FK | WAVE FL | WAVE FM | WAVE FN | WAVE FO | WAVE FP | WAVE FQ | WAVE FR | WAVE FS | WAVE FT | WAVE FU | WAVE FV | WAVE FW | WAVE FX | WAVE FY | WAVE FZ | WAVE GA | WAVE GB | WAVE GC | WAVE GD | WAVE GE | WAVE GF | WAVE GG | WAVE GH | WAVE GI | WAVE GJ | WAVE GK | WAVE GL | WAVE GM | WAVE GN | WAVE GO | WAVE GP | WAVE GQ | WAVE GR | WAVE GS | WAVE GT | WAVE GU | WAVE GV | WAVE GW | WAVE GX | WAVE GY | WAVE GZ | WAVE HA | WAVE HB | WAVE HC | WAVE HD | WAVE HE | WAVE HF | WAVE HG | WAVE HH | WAVE HI | WAVE HJ | WAVE HK | WAVE HL | WAVE HM | WAVE HN | WAVE HO | WAVE HP | WAVE HQ | WAVE HR | WAVE HS | WAVE HT | WAVE HU | WAVE HV | WAVE HW | WAVE HX | WAVE HY | WAVE HZ | WAVE IA | WAVE IB | WAVE IC | WAVE ID | WAVE IE | WAVE IF | WAVE IG | WAVE IH | WAVE II | WAVE IJ | WAVE IK | WAVE IL | WAVE IM | WAVE IN | WAVE IO | WAVE IP | WAVE IQ | WAVE IR | WAVE IS | WAVE IT | WAVE IU | WAVE IV | WAVE IW | WAVE IX | WAVE IY | WAVE IZ | WAVE JA | WAVE JB | WAVE JC | WAVE JD | WAVE JE | WAVE JF | WAVE JG | WAVE JH | WAVE JI | WAVE JJ | WAVE JK | WAVE JL | WAVE JM | WAVE JN | WAVE JO | WAVE JP | WAVE JQ | WAVE JR | WAVE JS | WAVE JT | WAVE JU | WAVE JV | WAVE JW | WAVE JX | WAVE JY | WAVE JZ | WAVE KA | WAVE KB | WAVE KC | WAVE KD | WAVE KE | WAVE KF | WAVE KG | WAVE KH | WAVE KI | WAVE KJ | WAVE KK | WAVE KL | WAVE KM | WAVE KN | WAVE KO | WAVE KP | WAVE KQ | WAVE KR | WAVE KS | WAVE KT | WAVE KU | WAVE KV | WAVE KW | WAVE KX | WAVE KY | WAVE KZ | WAVE LA | WAVE LB | WAVE LC | WAVE LD | WAVE LE | WAVE LF | WAVE LG | WAVE LH | WAVE LI | WAVE LJ | WAVE LK | WAVE LL | WAVE LM | WAVE LN | WAVE LO | WAVE LP | WAVE LQ | WAVE LR | WAVE LS | WAVE LT | WAVE LU | WAVE LV | WAVE LW | WAVE LX | WAVE LY | WAVE LZ | WAVE MA | WAVE MB | WAVE MC | WAVE MD | WAVE ME | WAVE MF | WAVE MG | WAVE MH | WAVE MI | WAVE MJ | WAVE MK | WAVE ML | WAVE MM | WAVE MN | WAVE MO | WAVE MP | WAVE MQ | WAVE MR | WAVE MS | WAVE MT | WAVE MU | WAVE MV | WAVE MW | WAVE MX | WAVE MY | WAVE MZ | WAVE NA | WAVE NB | WAVE NC | WAVE ND | WAVE NE | WAVE NF | WAVE NG | WAVE NH | WAVE NI | WAVE NJ | WAVE NK | WAVE NL | WAVE NM | WAVE NN | WAVE NO | WAVE NP | WAVE NQ | WAVE NR | WAVE NS | WAVE NT | WAVE NU | WAVE NV | WAVE NW | WAVE NX | WAVE NY | WAVE NZ | WAVE OA | WAVE OB | WAVE OC | WAVE OD | WAVE OE | WAVE OF | WAVE OG | WAVE OH | WAVE OI | WAVE OJ | WAVE OK | WAVE OL | WAVE OM | WAVE ON | WAVE OO | WAVE OP | WAVE OQ | WAVE OR | WAVE OS | WAVE OT | WAVE OU | WAVE OV | WAVE OW | WAVE OX | WAVE OY | WAVE OZ | WAVE PA | WAVE PB | WAVE PC | WAVE PD | WAVE PE | WAVE PF | WAVE PG | WAVE PH | WAVE PI | WAVE PJ | WAVE PK | WAVE PL | WAVE PM | WAVE PN | WAVE PO | WAVE PP | WAVE PQ | WAVE PR | WAVE PS | WAVE PT | WAVE PU | W |
|------|------|----------|------|------|---------|-----|------|----------|----------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---|
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RECEIVED  
FEDERAL BUREAU OF INVESTIGATION  
U.S. DEPARTMENT OF JUSTICE

DATE: 10/10/73  
TIME: 10:10 AM

TO: DIRECTOR, FBI  
FROM: SAC, NEW YORK

SUBJECT: [REDACTED]

RE: [REDACTED]

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| DATE       | TIME  | FROM | TO  | FLIGHT | STATUS | REMARKS |
|------------|-------|------|-----|--------|--------|---------|
| 2023-10-27 | 10:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-27 | 11:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-27 | 13:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-27 | 14:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-27 | 16:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-27 | 17:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-27 | 19:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-27 | 20:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-27 | 22:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-27 | 23:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 01:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 02:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 04:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 05:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 07:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 08:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 10:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 11:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 13:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 14:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 16:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 17:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 19:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 20:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-28 | 22:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-28 | 23:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 01:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 02:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 04:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 05:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 07:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 08:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 10:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 11:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 13:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 14:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 16:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 17:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 19:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 20:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-29 | 22:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-29 | 23:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-30 | 01:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-30 | 02:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-30 | 04:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-30 | 05:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-30 | 07:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-30 | 08:30 | BOM  | DEL | AI-678 | OK     |         |
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| 2023-10-30 | 13:00 | DEL  | BOM | AI-678 | OK     |         |
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| 2023-10-30 | 17:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-30 | 19:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-30 | 20:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-30 | 22:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-30 | 23:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-31 | 01:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-31 | 02:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-31 | 04:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-31 | 05:30 | BOM  | DEL | AI-678 | OK     |         |
| 2023-10-31 | 07:00 | DEL  | BOM | AI-678 | OK     |         |
| 2023-10-31 | 08:30 | BOM  | DEL | AI-678 | OK     |         |

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|  | N | 3.52 | 3.56-5.00 | 5.01-5.50 | 5.51-6.00 | 6.01-6.50 | 6.51-7.00 | 7.01-7.50 | 7.51-8.00 | 8.01-8.50 | 8.51-9.00 | 9.01-9.50 | 9.51-10.00 | 10.01-10.50 | 10.51-11.00 | 11.01-11.50 | 11.51-12.00 | 12.01-12.50 | 12.51-13.00 | 13.01-13.50 | 13.51-14.00 | 14.01-14.50 | 14.51-15.00 | 15.01-15.50 | 15.51-16.00 | 16.01-16.50 | 16.51-17.00 | 17.01-17.50 | 17.51-18.00 | 18.01-18.50 | 18.51-19.00 | 19.01-19.50 | 19.51-20.00 | 20.01-20.50 | 20.51-21.00 | 21.01-21.50 | 21.51-22.00 | 22.01-22.50 | 22.51-23.00 | 23.01-23.50 | 23.51-24.00 | 24.01-24.50 | 24.51-25.00 | 25.01-25.50 | 25.51-26.00 | 26.01-26.50 | 26.51-27.00 | 27.01-27.50 | 27.51-28.00 | 28.01-28.50 | 28.51-29.00 | 29.01-29.50 | 29.51-30.00 | 30.01-30.50 | 30.51-31.00 | 31.01-31.50 | 31.51-32.00 | 32.01-32.50 | 32.51-33.00 | 33.01-33.50 | 33.51-34.00 | 34.01-34.50 | 34.51-35.00 | 35.01-35.50 | 35.51-36.00 | 36.01-36.50 | 36.51-37.00 | 37.01-37.50 | 37.51-38.00 | 38.01-38.50 | 38.51-39.00 | 39.01-39.50 | 39.51-40.00 | 40.01-40.50 | 40.51-41.00 | 41.01-41.50 | 41.51-42.00 | 42.01-42.50 | 42.51-43.00 | 43.01-43.50 | 43.51-44.00 | 44.01-44.50 | 44.51-45.00 | 45.01-45.50 | 45.51-46.00 | 46.01-46.50 | 46.51-47.00 | 47.01-47.50 | 47.51-48.00 | 48.01-48.50 | 48.51-49.00 | 49.01-49.50 | 49.51-50.00 | 50.01-50.50 | 50.51-51.00 | 51.01-51.50 | 51.51-52.00 | 52.01-52.50 | 52.51-53.00 | 53.01-53.50 | 53.51-54.00 | 54.01-54.50 | 54.51-55.00 | 55.01-55.50 | 55.51-56.00 | 56.01-56.50 | 56.51-57.00 | 57.01-57.50 | 57.51-58.00 | 58.01-58.50 | 58.51-59.00 | 59.01-59.50 | 59.51-60.00 | 60.01-60.50 | 60.51-61.00 | 61.01-61.50 | 61.51-62.00 | 62.01-62.50 | 62.51-63.00 | 63.01-63.50 | 63.51-64.00 | 64.01-64.50 | 64.51-65.00 | 65.01-65.50 | 65.51-66.00 | 66.01-66.50 | 66.51-67.00 | 67.01-67.50 | 67.51-68.00 | 68.01-68.50 | 68.51-69.00 | 69.01-69.50 | 69.51-70.00 | 70.01-70.50 | 70.51-71.00 | 71.01-71.50 | 71.51-72.00 | 72.01-72.50 | 72.51-73.00 | 73.01-73.50 | 73.51-74.00 | 74.01-74.50 | 74.51-75.00 | 75.01-75.50 | 75.51-76.00 | 76.01-76.50 | 76.51-77.00 | 77.01-77.50 | 77.51-78.00 | 78.01-78.50 | 78.51-79.00 | 79.01-79.50 | 79.51-80.00 | 80.01-80.50 | 80.51-81.00 | 81.01-81.50 | 81.51-82.00 | 82.01-82.50 | 82.51-83.00 | 83.01-83.50 | 83.51-84.00 | 84.01-84.50 | 84.51-85.00 | 85.01-85.50 | 85.51-86.00 | 86.01-86.50 | 86.51-87.00 | 87.01-87.50 | 87.51-88.00 | 88.01-88.50 | 88.51-89.00 | 89.01-89.50 | 89.51-90.00 | 90.01-90.50 | 90.51-91.00 | 91.01-91.50 | 91.51-92.00 | 92.01-92.50 | 92.51-93.00 | 93.01-93.50 | 93.51-94.00 | 94.01-94.50 | 94.51-95.00 | 95.01-95.50 | 95.51-96.00 | 96.01-96.50 | 96.51-97.00 | 97.01-97.50 | 97.51-98.00 | 98.01-98.50 | 98.51-99.00 | 99.01-99.50 | 99.51-100.00 | 100.01-100.50 | 100.51-101.00 | 101.01-101.50 | 101.51-102.00 | 102.01-102.50 | 102.51-103.00 | 103.01-103.50 | 103.51-104.00 | 104.01-104.50 | 104.51-105.00 | 105.01-105.50 | 105.51-106.00 | 106.01-106.50 | 106.51-107.00 | 107.01-107.50 | 107.51-108.00 | 108.01-108.50 | 108.51-109.00 | 109.01-109.50 | 109.51-110.00 | 110.01-110.50 | 110.51-111.00 | 111.01-111.50 | 111.51-112.00 | 112.01-112.50 | 112.51-113.00 | 113.01-113.50 | 113.51-114.00 | 114.01-114.50 | 114.51-115.00 | 115.01-115.50 | 115.51-116.00 | 116.01-116.50 | 116.51-117.00 | 117.01-117.50 | 117.51-118.00 | 118.01-118.50 | 118.51-119.00 | 119.01-119.50 | 119.51-120.00 | 120.01-120.50 | 120.51-121.00 | 121.01-121.50 | 121.51-122.00 | 122.01-122.50 | 122.51-123.00 | 123.01-123.50 | 123.51-124.00 | 124.01-124.50 | 124.51-125.00 | 125.01-125.50 | 125.51-126.00 | 126.01-126.50 | 126.51-127.00 | 127.01-127.50 | 127.51-128.00 | 128.01-128.50 | 12 |
|--|---|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----|
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|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99  | 100 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |     |

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|

[illegible]

| Year | Age | Sex  | Length (cm) | Weight (kg) | Length (cm) | Weight (kg) | Length (cm) | Weight (kg) |
|------|-----|------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1964 | 25  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1965 | 26  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1966 | 27  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1967 | 28  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1968 | 29  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1969 | 30  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1970 | 31  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1971 | 32  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1972 | 33  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1973 | 34  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1974 | 35  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1975 | 36  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1976 | 37  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1977 | 38  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1978 | 39  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1979 | 40  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1980 | 41  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1981 | 42  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1982 | 43  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1983 | 44  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1984 | 45  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1985 | 46  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1986 | 47  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1987 | 48  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1988 | 49  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1989 | 50  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1990 | 51  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1991 | 52  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1992 | 53  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1993 | 54  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1994 | 55  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1995 | 56  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1996 | 57  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1997 | 58  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1998 | 59  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 1999 | 60  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2000 | 61  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2001 | 62  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2002 | 63  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2003 | 64  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2004 | 65  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 2005 | 66  | Male | 120.0       | 10.0        | 120.0       | 10.0        | 120.0       | 10.0        |
| 200  |     |      |             |             |             |             |             |             |

[illegible]

| Run | Time | Temp | Pressure | Flow | Detector | Response |
|-----|------|------|----------|------|----------|----------|
| 1   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 2   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 3   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 4   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 5   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 6   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 7   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 8   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 9   | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 10  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 11  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 12  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 13  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 14  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 15  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 16  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 17  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 18  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 19  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 20  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 21  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 22  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 23  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 24  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 25  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 26  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 27  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 28  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 29  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 30  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 31  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 32  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 33  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 34  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 35  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 36  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 37  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 38  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 39  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 40  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 41  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 42  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 43  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 44  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 45  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 46  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 47  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 48  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 49  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 50  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 51  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 52  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 53  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 54  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 55  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 56  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 57  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |
| 58  | 10.0 | 100  | 1.0      | 1.0  | 1.0      | 1.0      |

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|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 |
| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 |

[illegible][illegible][illegible]

|  | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 | Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 | Q31 | Q32 | Q33 | Q34 | Q35 | Q36 | Q37 | Q38 | Q39 | Q40 | Q41 | Q42 | Q43 | Q44 | Q45 | Q46 | Q47 | Q48 | Q49 | Q50 | Q51 | Q52 | Q53 | Q54 | Q55 | Q56 | Q57 | Q58 | Q59 | Q60 | Q61 | Q62 | Q63 | Q64 | Q65 | Q66 | Q67 | Q68 | Q69 | Q70 | Q71 | Q72 | Q73 | Q74 | Q75 | Q76 | Q77 | Q78 | Q79 | Q80 | Q81 | Q82 | Q83 | Q84 | Q85 | Q86 | Q87 | Q88 | Q89 | Q90 | Q91 | Q92 | Q93 | Q94 | Q95 | Q96 | Q97 | Q98 | Q99 | Q100 | Q101 | Q102 | Q103 | Q104 | Q105 | Q106 | Q107 | Q108 | Q109 | Q110 | Q111 | Q112 | Q113 | Q114 | Q115 | Q116 | Q117 | Q118 | Q119 | Q120 | Q121 | Q122 | Q123 | Q124 | Q125 | Q126 | Q127 | Q128 | Q129 | Q130 | Q131 | Q132 | Q133 | Q134 | Q135 | Q136 | Q137 | Q138 | Q139 | Q140 | Q141 | Q142 | Q143 | Q144 | Q145 | Q146 | Q147 | Q148 | Q149 | Q150 | Q151 | Q152 | Q153 | Q154 | Q155 | Q156 | Q157 | Q158 | Q159 | Q160 | Q161 | Q162 | Q163 | Q164 | Q165 | Q166 | Q167 | Q168 | Q169 | Q170 | Q171 | Q172 | Q173 | Q174 | Q175 | Q176 | Q177 | Q178 | Q179 | Q180 | Q181 | Q182 | Q183 | Q184 | Q185 | Q186 | Q187 | Q188 | Q189 | Q190 | Q191 | Q192 | Q193 | Q194 | Q195 | Q196 | Q197 | Q198 | Q199 | Q200 | Q201 | Q202 | Q203 | Q204 | Q205 | Q206 | Q207 | Q208 | Q209 | Q210 | Q211 | Q212 | Q213 | Q214 | Q215 | Q216 | Q217 | Q218 | Q219 | Q220 | Q221 | Q222 | Q223 | Q224 | Q225 | Q226 | Q227 | Q228 | Q229 | Q230 | Q231 | Q232 | Q233 | Q234 | Q235 | Q236 | Q237 | Q238 | Q239 | Q240 | Q241 | Q242 | Q243 | Q244 | Q245 | Q246 | Q247 | Q248 | Q249 | Q250 | Q251 | Q252 | Q253 | Q254 | Q255 | Q256 | Q257 | Q258 | Q259 | Q260 | Q261 | Q262 | Q263 | Q264 | Q265 | Q266 | Q267 | Q268 | Q269 | Q270 | Q271 | Q272 | Q273 | Q274 | Q275 | Q276 | Q277 | Q278 | Q279 | Q280 | Q281 | Q282 | Q283 | Q284 | Q285 | Q286 | Q287 | Q288 | Q289 | Q290 | Q291 | Q292 | Q293 | Q294 | Q295 | Q296 | Q297 | Q298 | Q299 | Q300 | Q301 | Q302 | Q303 | Q304 | Q305 | Q306 | Q307 | Q308 | Q309 | Q310 | Q311 | Q312 | Q313 | Q314 | Q315 | Q316 | Q317 | Q318 | Q319 | Q320 | Q321 | Q322 | Q323 | Q324 | Q325 | Q326 | Q327 | Q328 | Q329 | Q330 | Q331 | Q332 | Q333 | Q334 | Q335 | Q336 | Q337 | Q338 | Q339 | Q340 | Q341 | Q342 | Q343 | Q344 | Q345 | Q346 | Q347 | Q348 | Q349 | Q350 | Q351 | Q352 | Q353 | Q354 | Q355 | Q356 | Q357 | Q358 | Q359 | Q360 | Q361 | Q362 | Q363 | Q364 | Q365 | Q366 | Q367 | Q368 | Q369 | Q370 | Q371 | Q372 | Q373 | Q374 | Q375 | Q376 | Q377 | Q378 | Q379 | Q380 | Q381 | Q382 | Q383 | Q384 | Q385 | Q386 | Q387 | Q388 | Q389 | Q390 | Q391 | Q392 | Q393 | Q394 | Q395 | Q396 | Q397 | Q398 | Q399 | Q400 | Q401 | Q402 | Q403 | Q404 | Q405 | Q406 | Q407 | Q408 | Q409 | Q410 | Q411 | Q412 | Q413 | Q414 | Q415 | Q416 | Q417 | Q418 | Q419 | Q420 | Q421 | Q422 | Q423 | Q424 | Q425 | Q426 | Q427 | Q428 | Q429 | Q430 | Q431 | Q432 | Q433 | Q434 | Q435 | Q436 | Q437 | Q438 | Q439 | Q440 | Q441 | Q442 | Q443 | Q444 | Q445 | Q446 | Q447 | Q448 | Q449 | Q450 | Q451 | Q452 | Q453 | Q454 | Q455 | Q456 | Q457 | Q458 | Q459 | Q460 | Q461 | Q462 | Q463 | Q464 | Q465 | Q466 | Q467 | Q468 | Q469 | Q470 | Q471 | Q472 | Q473 | Q474 | Q475 | Q476 | Q477 | Q478 | Q479 | Q480 | Q481 | Q482 | Q483 | Q484 | Q485 | Q486 | Q487 | Q488 | Q489 | Q490 | Q491 | Q492 | Q493 | Q494 | Q495 | Q496 | Q497 | Q498 | Q499 | Q500 | Q501 | Q502 | Q503 | Q504 | Q505 | Q506 | Q507 | Q508 | Q509 | Q510 | Q511 | Q512 | Q513 | Q514 | Q515 | Q516 | Q517 | Q518 | Q519 | Q520 | Q521 | Q522 | Q523 | Q524 | Q525 | Q526 | Q527 | Q528 | Q529 | Q530 | Q531 | Q532 | Q533 | Q534 | Q535 | Q536 | Q537 | Q538 | Q539 | Q540 | Q541 | Q542 | Q543 | Q544 | Q545 | Q546 | Q547 | Q548 | Q549 | Q550 | Q551 | Q552 | Q553 | Q554 | Q555 | Q556 | Q557 | Q558 | Q559 | Q560 | Q561 | Q562 | Q563 | Q564 | Q565 | Q566 | Q567 | Q568 | Q569 | Q570 | Q571 | Q572 | Q573 | Q574 | Q575 | Q576 | Q577 | Q578 | Q579 | Q580 | Q581 | Q582 | Q583 | Q584 | Q585 | Q586 | Q587 | Q588 | Q589 | Q590 | Q591 | Q592 | Q593 | Q594 | Q595 | Q596 | Q597 | Q598 | Q599 | Q600 | Q601 | Q602 | Q603 | Q604 | Q605 | Q606 | Q607 | Q608 | Q609 | Q610 | Q611 | Q612 | Q613 | Q614 | Q615 | Q616 | Q617 | Q618 | Q619 | Q620 | Q621 | Q622 | Q623 | Q624 | Q625 | Q626 | Q627 | Q628 | Q629 | Q630 | Q631 | Q632 | Q633 | Q634 | Q635 | Q636 | Q637 | Q638 | Q639 | Q640 | Q641 | Q642 | Q643 | Q644 | Q645 | Q646 | Q647 | Q648 | Q649 | Q650 | Q651 | Q652 | Q653 | Q654 | Q655 | Q656 | Q657 | Q658 | Q659 | Q660 | Q661 | Q662 | Q663 | Q664 | Q665 | Q666 | Q667 | Q668 | Q669 | Q670 | Q671 | Q672 | Q673 | Q674 | Q675 | Q676 | Q677 | Q678 | Q679 | Q680 | Q681 | Q682 | Q683 | Q684 | Q685 | Q686 | Q687 | Q688 | Q689 | Q690 | Q691 | Q692 | Q693 | Q694 | Q695 | Q696 | Q697 | Q698 | Q699 | Q700 | Q701 | Q702 | Q703 | Q704 | Q705 | Q706 | Q707 | Q708 | Q709 | Q710 | Q711 | Q712 | Q713 | Q714 | Q715 | Q716 | Q717 | Q718 | Q719 | Q720 | Q721 | Q722 | Q723 | Q724 | Q725 | Q726 | Q727 | Q728 | Q729 | Q730 | Q731 | Q732 | Q733 | Q734 | Q735 | Q736 | Q737 | Q738 | Q739 | Q740 | Q741 | Q742 | Q743 | Q744 | Q745 | Q746 | Q747 | Q748 | Q749 | Q750 | Q751 | Q752 | Q753 | Q754 | Q755 | Q756 | Q757 | Q758 | Q759 | Q760 | Q761 | Q762 | Q763 | Q764 | Q765 | Q766 | Q767 | Q768 | Q769 | Q770 | Q771 | Q772 | Q773 | Q774 | Q775 | Q776 | Q777 | Q778 | Q779 | Q780 | Q781 | Q782 | Q783 | Q784 | Q785 | Q786 | Q787 | Q788 | Q789 | Q790 | Q791 | Q792 | Q793 | Q794 | Q795 | Q796 | Q797 | Q798 | Q799 | Q800 | Q801 | Q802 | Q803 | Q804 | Q805 | Q806 | Q807 | Q808 | Q809 | Q810 | Q811 | Q812 | Q813 | Q814 | Q815 | Q816 | Q817 | Q818 | Q819 | Q820 | Q821 | Q822 | Q823 | Q824 | Q825 | Q826 | Q827 | Q828 | Q829 | Q830 | Q831 | Q832 | Q833 | Q834 | Q835 | Q836 | Q837 | Q838 | Q839 | Q840 | Q841 | Q842 | Q843 | Q844 | Q845 | Q846 | Q847 | Q848 | Q849 | Q850 | Q851 | Q852 | Q853 | Q854 | Q855 | Q856 | Q857 | Q858 | Q859 | Q860 | Q861 | Q862 | Q863 | Q864 | Q865 | Q866 | Q867 | Q868 | Q869 | Q870 | Q871 | Q872 | Q873 | Q874 | Q875 | Q876 | Q877 | Q878 | Q879 | Q880 | Q881 | Q882 | Q883 | Q884 | Q885 | Q886 | Q887 | Q888 | Q889 | Q890 | Q891 | Q892 | Q893 | Q894 | Q895 | Q896 | Q897 | Q898 | Q899 | Q900 | Q901 | Q902 | Q903 | Q904 | Q905 | Q906 | Q907 | Q908 | Q909 | Q910 | Q911 | Q912 | Q913 | Q914 | Q915 | Q916 | Q917 | Q918 | Q919 | Q920 | Q921 | Q922 | Q923 | Q924 | Q925 | Q926 | Q927 | Q928 | Q929 | Q930 | Q931 | Q932 | Q933 | Q934 | Q935 | Q936 | Q937 | Q938 | Q939 | Q940 | Q941 | Q942 | Q943 | Q944 | Q945 | Q946 | Q947 | Q948 | Q949 | Q950 | Q951 | Q952 | Q953 | Q954 | Q955 | Q956 | Q957 | Q958 | Q959 | Q960 | Q961 | Q962 | Q963 | Q964 | Q965 | Q966 | Q967 | Q968 | Q969 | Q970 | Q971 | Q972 | Q973 | Q974 | Q975 | Q976 | Q977 | Q978 | Q979 | Q980 | Q981 | Q982 | Q983 | Q984 | Q985 | Q986 | Q987 | Q988 | Q989 | Q990 | Q991 | Q992 | Q993 | Q994 | Q995 | Q996 | Q997 | Q998 | Q999 | Q1000 |
|--|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-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|--|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-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## References

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66-67 100% 68-69 100% 70-71 100% 72-73 100% 74-75 100% 76-77 100% 78-79 100% 80-81 100% 82-83 100% 84-85 100% 86-87 100% 88-89 100% 90-91 100% 92-93 100% 94-95 100% 96-97 100% 98-99 100% 100-101 100% 102-103 100% 104-105 100% 106-107 100% 108-109 100% 110-111 100% 112-113 100% 114-115 100% 116-117 100% 118-119 100% 120-121 100% 122-123 100% 124-125 100% 126-127 100% 128-129 100% 130-131 100% 132-133 100% 134-135 100% 136-137 100% 138-139 100% 140-141 100% 142-143 100% 144-145 100% 146-147 100% 148-149 100% 150-151 100% 152-153 100% 154-155 100% 156-157 100% 158-159 100% 160-161 100% 162-163 100% 164-165 100% 166-167 100% 168-169 100% 170-171 100% 172-173 100% 174-175 100% 176-177 100% 178-179 100% 180-181 100% 182-183 100% 184-185 100% 186-187 100% 188-189 100% 190-191 100% 192-193 100% 194-195 100% 196-197 100% 198-199 100% 200-201 100% 202-203 100% 204-205 100% 206-207 100% 208-209 100% 210-211 100% 212-213 100% 214-215 100% 216-217 100% 218-219 100% 220-221 100% 222-223 100% 224-225 100% 226-227 100% 228-229 100% 230-231 100% 232-233 100% 234-235 100% 236-237 100% 238-239 100% 240-241 100% 242-243 100% 244-245 100% 246-247 100% 248-249 100% 250-251 100% 252-253 100% 254-255 100% 256-257 100% 258-259 100% 260-261 100% 262-263 100% 264-265 100% 266-267 100% 268-269 100% 270-271 100% 272-273 100% 274-275 100% 276-277 100% 278-279 100% 280-281 100% 282-283 100% 284-285 100% 286-287 100% 288-289 100% 290-291 100% 292-293 100% 294-295 100% 296-297 100% 298-299 100% 300-301 100% 302-303 100% 304-305 100% 306-307 100% 308-309 100% 310-311 100% 312-313 100% 314-315 100% 316-317 100% 318-319 100% 320-321 100% 322-323 100% 324-325 100% 326-327 100% 328-329 100% 330-331 100% 332-333 100% 334-335 100% 336-337 100% 338-339 100% 340-341 100% 342-343 100% 344-345 100% 346-347 100% 348-349 100% 350-351 100% 352-353 100% 354-355 100% 356-357 100% 358-359 100% 360-361 100% 362-363 100% 364-365 100% 366-367 100% 368-369 100% 370-371 100% 372-373 100% 374-375 100% 376-377 100% 378-379 100% 380-381 100% 382-383 100% 384-385 100% 386-387 100% 388-389 100% 390-391 100% 392-393 100% 394-395 100% 396-397 100% 398-399 100% 400-401 100% 402-403 100% 404-405 100% 406-407 100% 408-409 100% 410-411 100% 412-413 100% 414-415 100% 416-417 100% 418-419 100% 420-421 100% 422-423 100% 424-425 100% 426-427 100% 428-429 100% 430-431 100% 432-433 100% 434-435 100% 436-437 100% 438-439 100% 440-441 100% 442-443 100% 444-445 100% 446-447 100% 448-449 100% 450-451 100% 452-453 100% 454-455 100% 456-457 100% 458-459 100% 460-461 100% 462-463 100% 464-465 100% 466-467 100% 468-469 100% 470-471 100% 472-473 100% 474-475 100% 476-477 100% 478-479 100% 480-481 100% 482-483 100% 484-485 100% 486-487 100% 488-489 100% 490-491 100% 492-493 100% 494-495 100% 496-497 100% 498-499 100% 500-501 100% 502-503 100% 504-505 100% 506-507 100% 508-509 100% 510-511 100% 512-513 100% 514-515 100% 516-517 100% 518-519 100% 520-521 100% 522-523 100% 524-525 100% 526-527 100% 528-529 100% 530-531 100% 532-533 100% 534-535 100% 536-537 100% 538-539 100% 540-541 100% 542-543 100% 544-545 100% 546-547 100% 548-549 100% 550-551 100% 552-553 100% 554-555 100% 556-557 100% 558-559 100% 560-561 100% 562-563 100% 564-565 100% 566-567 100% 568-569 100% 570-571 100% 572-573 100% 574-575 100% 576-577 100% 578-579 100% 580-581 100% 582-583 100% 584-585 100% 586-587 100% 588-589 100% 590-591 100% 592-593 100% 594-595 100% 596-597 100% 598-599 100% 600-601 100% 602-603 100% 604-605 100% 606-607 100% 608-609 100% 610-611 100% 612-613 100% 614-615 100% 616-617 100% 618-619 100% 620-621 100% 622-623 100% 624-625 100% 626-627 100% 628-629 100% 630-631 100% 632-633 100% 634-635 100% 636-637 100% 638-639 100% 640-641 100% 642-643 100% 644-645 100% 646-647 100% 648-649 100% 650-651 100% 652-653 100% 654-655 100% 656-657 100% 658-659 100% 660-661 100% 662-663 100% 664-665 100% 666-667 100% 668-669 100% 670-671 100% 672-673 100% 674-675 100% 676-677 100% 678-679 100% 680-681 100% 682-683 100% 684-685 100% 686-687 100% 688-689 100% 690-691 100% 692-693 100% 694-695 100% 696-697 100% 698-699 100% 700-

30. *Journal of the American Medical Association*, 273, 1995, 1000-1001.

C4H<sub>9</sub>Br + NaOH → C<sub>4</sub>H<sub>9</sub>OH + NaBr  
 100 g C<sub>4</sub>H<sub>9</sub>Br ×  $\frac{1 \text{ mol C}_4\text{H}_9\text{Br}}{137 \text{ g C}_4\text{H}_9\text{Br}}$  ×  $\frac{1 \text{ mol C}_4\text{H}_9\text{OH}}{1 \text{ mol C}_4\text{H}_9\text{Br}}$  ×  $\frac{74 \text{ g C}_4\text{H}_9\text{OH}}{1 \text{ mol C}_4\text{H}_9\text{OH}}$  = 53.98 g C<sub>4</sub>H<sub>9</sub>OH

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| Category            | Value    |
|---------------------|----------|
| 1. <b>1.1.1.1</b>   | 1.1.1.1  |
| 2. <b>1.1.1.2</b>   | 1.1.1.2  |
| 3. <b>1.1.1.3</b>   | 1.1.1.3  |
| 4. <b>1.1.1.4</b>   | 1.1.1.4  |
| 5. <b>1.1.1.5</b>   | 1.1.1.5  |
| 6. <b>1.1.1.6</b>   | 1.1.1.6  |
| 7. <b>1.1.1.7</b>   | 1.1.1.7  |
| 8. <b>1.1.1.8</b>   | 1.1.1.8  |
| 9. <b>1.1.1.9</b>   | 1.1.1.9  |
| 10. <b>1.1.1.10</b> | 1.1.1.10 |
| 11. <b>1.1.1.11</b> | 1.1.1.11 |
| 12. <b>1.1.1.12</b> | 1.1.1.12 |
| 13. <b>1.1.1.13</b> | 1.1.1.13 |
| 14. <b>1.1.1.14</b> | 1.1.1.14 |
| 15. <b>1.1.1.15</b> | 1.1.1.15 |
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| 22. <b>1.1.1.22</b> | 1.1.1.22 |
| 23. <b>1.1.1.23</b> | 1.1.1.23 |
| 24. <b>1.1.1.24</b> | 1.1.1.24 |
| 25. <b>1.1.1.25</b> | 1.1.1.25 |
| 26. <b>1.1.1.26</b> | 1.1.1.26 |
| 27. <b>1.1.1.27</b> | 1.1.1.27 |
| 28. <b>1.1.1.28</b> | 1.1.1.28 |
| 29. <b>1.1.1.29</b> | 1.1.1.29 |
| 30. <b>1.1.1.30</b> | 1.1.1.30 |
| 31. <b>1.1.1.31</b> | 1.1.1.31 |
| 32. <b>1.1.1.32</b> | 1.1.1.32 |
| 33. <b>1.1.1.33</b> | 1.1.1.33 |
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| 38. <b>1.1.1.38</b> | 1.1.1.38 |
| 39. <b>1.1.1.39</b> | 1.1.1.39 |
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| 41. <b>1.1.1.41</b> | 1.1.1.41 |
| 42. <b>1.1.1.42</b> | 1.1.1.42 |
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| 44. <b>1.1.1.44</b> | 1.1.1.44 |
| 45. <b>1.1.1.45</b> | 1.1.1.45 |
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**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**BASIS / ASSUMPTIONS (Indigenous)**

|                                         | FY 2021-22       |                  |
|-----------------------------------------|------------------|------------------|
|                                         | <u>Jul - Dec</u> | <u>Jan - Jun</u> |
| <b>Exchange Parity Rs per US\$</b>      | <b>165.00</b>    | <b>170.00</b>    |
| <b><u>Crude oil US\$ per Barrel</u></b> |                  |                  |
| Average FOB Prices                      | 44.4813          | 49.4813          |
| Freight                                 | 0.5187           | 0.5187           |
| <b>Average C&amp;F Prices</b>           | <b>45.0000</b>   | <b>50.0000</b>   |
| MMBTU/BBL                               | 5.6098           | 5.6098           |
| <b><u>HSFO US\$ per M. Ton.</u></b>     |                  |                  |
| Average FOB Prices                      | 265.6299         | 265.6299         |
| Freight                                 | 4.3701           | 4.3701           |
| <b>Average C&amp;F Prices</b>           | <b>270.0000</b>  | <b>270.0000</b>  |
| MMBTU per M. Ton.                       | 40.7920          | 40.7920          |





34 - ESTIMATED COSTS OF CONSTRUCTION

ESTIMATED COSTS OF CONSTRUCTION

| Item                   | Unit           | Quantity | Unit Price | Subtotal | Material | Manpower | Equipment | Subcontract | Indirects | Profit | Total  | Remarks |
|------------------------|----------------|----------|------------|----------|----------|----------|-----------|-------------|-----------|--------|--------|---------|
| 1. Excavation          | m <sup>3</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 2. Backfill            | m <sup>3</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 3. Foundation          | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 4. Wall                | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 5. Floor               | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 6. Ceiling             | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 7. Roof                | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 8. Stairs              | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 9. Windows             | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 10. Doors              | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 11. Electrical         | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 12. Plumbing           | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 13. HVAC               | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 14. Fire Protection    | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 15. Security           | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 16. Landscaping        | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 17. Fencing            | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 18. Signage            | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 19. Lighting           | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 20. Telecommunications | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| 21. Other              | m <sup>2</sup> | 100      | 1.50       | 150.00   | 100      | 10       | 5         | 10          | 10        | 10     | 145.00 |         |
| <b>Total</b>           |                |          |            |          |          |          |           |             |           |        |        |         |



**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**[5] - GAS INTERNALLY CONSUMED**

**Indigenous Gas**

**Particulars**

**Transmission System**

Compressors

Coating Plant

Residential Colonies

Sub total

**Distribution System**

Free Gas Facility

Co-Generation

Sub total

**GIC Indigenous**

| MMCF                       | GCV | MMBTU            | Avg. cost price | M/Rs.            |
|----------------------------|-----|------------------|-----------------|------------------|
| 2,843                      | 943 | 2,680,636        | 479             | 1,284,782        |
| 109                        | 943 | 102,878          | 479             | 49,308           |
| 74                         | 943 | 69,801           | 479             | 33,454           |
| <b>3,026</b>               |     | <b>2,853,316</b> |                 | <b>1,367,544</b> |
| 536                        | 943 | 505,165          | 479             | 242,116          |
| 87                         | 943 | 81,670           | 479             | 39,143           |
| <b>623</b>                 |     | <b>586,834</b>   |                 | <b>281,259</b>   |
| <b>3,649</b>               |     | <b>3,440,150</b> |                 | <b>1,648,803</b> |
| <b>GIC as per Petition</b> |     |                  |                 | <b>1,284,782</b> |

**Note:**

- 1) Volume of Coating Plant, Residential Colonies, Free Gas Facility and Co-Gen is projected at the level of FY 2019-20.  
 2) GIC relevant to the operations of compressors has been taken under the head of GIC. The gas consumed on account of free gas facility, residential colonies, co generation and coating plant has been booked under the relevant heads, i.e. HR cost and fuel and power.

**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**[6] - UFG DISALLOWANCE**

|                                     |                  | Indigenous Gas<br>(Volume in MMCF) |
|-------------------------------------|------------------|------------------------------------|
| <b>1 Gas Purchases</b>              |                  |                                    |
| Gas Received in SNGPL system        |                  | 364,883                            |
| Energy Equivalence - RLNG           |                  | -                                  |
| <b>A Net gas received</b>           | <b>A</b>         | <b>364,883</b>                     |
| <b>Gas Internally consumed:</b>     |                  |                                    |
| Transmission system                 |                  | 3,026                              |
| Distribution system                 |                  | 622                                |
| <b>B Total Internal Consumption</b> | <b>B</b>         | <b>3,649</b>                       |
| <b>C Gas available for sales</b>    | <b>C=A-B</b>     | <b>361,234</b>                     |
| <u><b>Gas sales</b></u>             |                  |                                    |
| Billed Volume                       |                  | 334,269                            |
| <b>D Total Gas Sales</b>            |                  | <b>334,269</b>                     |
| <b>E UFG Volume (A-B)</b>           | <b>E=C-D</b>     | <b>26,965</b>                      |
| <b>F UFG %age</b>                   | <b>F=E/A*100</b> | <b>7.39</b>                        |

**SAL NORTHERN GAS PIPELINES LIMITED**  
**MEMORANDUM FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

(A) - TWO COST (ERR FY 2021-22)

| Sr | Description                                      | 2020-21      | 2021-22       | 2020-21       | 2021-22      | 2020-21       | 2021-22      | 2020-21       | 2021-22       | 2020-21       | 2021-22       |
|----|--------------------------------------------------|--------------|---------------|---------------|--------------|---------------|--------------|---------------|---------------|---------------|---------------|
|    |                                                  | Actual       | Estimate      | Actual        | Estimate     | Actual        | Estimate     | Actual        | Estimate      | Actual        | Estimate      |
| 1  | HR Cost                                          | 3,123        | 2,071         | 5,596         | 4,244        | 5,982         | 4,046        | 9,153         | 5,153         | 13,569        | 10,764        |
| 2  | Stores & spares consumed                         | 330          | 288           | 607           | 362          | 965           | 15           | 27            | 558           | 607           | 607           |
| 3  | Repairs & maintenance of system                  | 205          | 211           | 476           | 666          | 1,508         | 123          | 278           | 2,262         | 1,000         | 1,000         |
| 4  | Stationery, consumables and postage              | 10           | 8             | 18            | 22           | 51            | 15           | 170           | 133           | 205           | 205           |
| 5  | Rent, rates, royalty, electricity and telephone  | 120          | 95            | 215           | 137          | 309           | 100          | 228           | 419           | 392           | 392           |
| 6  | Travelling expenses                              | 38           | 30            | 63            | 35           | 80            | 24           | 54            | 111           | 50            | 50            |
| 7  | Transport expenses                               | 159          | 121           | 274           | 312          | 500           | 82           | 183           | 690           | 513           | 513           |
| 8  | Insurance                                        | 44           | 35            | 70            | 68           | 153           | 43           | 97            | 184           | 146           | 146           |
| 9  | Fuel & Power                                     | 305          | 113           | 280           | 128          | 290           | -            | -             | 307           | 243           | 243           |
| 10 | Legal and Professional services                  | 46           | 37            | 83            | 72           | 167           | 46           | 105           | 156           | 153           | 153           |
| 11 | ISO 14001 & OHSAS Certification                  | 1            | 1             | 2             | 1            | 4             | 1            | 3             | 5             | 4             | 4             |
| 12 | Advertisement & publicity                        | 5            | 4             | 8             | 7            | 16            | 128          | 129           | 141           | 172           | 172           |
| 13 | Protective clothing & supplies                   | 13           | 10            | 23            | 20           | 45            | 72           | 28            | 54            | 47            | 47            |
| 14 | Staff catering expenses                          | 3            | 2             | 5             | 5            | 10            | 3            | 6             | 12            | 10            | 10            |
| 15 | Staff Training Expenses                          | 8            | 7             | 15            | 13           | 29            | 30           | 18            | 35            | 27            | 27            |
| 16 | Security expenses                                | 865          | 805           | 1,349         | 80           | 156           | 52           | 218           | 1,004         | 819           | 819           |
| 17 | Sponsorship of Chair for Unhaskhas               | 1            | 1             | 2             | 2            | 5             | 2            | 1             | 6             | 4             | 4             |
| 18 | Outsourcing of Call Center                       | -            | -             | -             | -            | -             | 17           | 30            | 17            | 13            | 13            |
| 19 | Sports and expenses / Annual Sports              | 13           | 10            | 23            | 20           | 45            | 16           | 18            | 54            | 42            | 42            |
| 20 | OSRA fee                                         | -            | -             | -             | -            | -             | 279          | 371           | 279           | 92            | 92            |
| 21 | Bank Charges                                     | 3            | 1             | 2             | 2            | 5             | 1            | 3             | 5             | 4             | 4             |
| 22 | Facilities provided by order companies           | 5            | 4             | 9             | 7            | 17            | 6            | 31            | 20            | 26            | 26            |
| 23 | Plant Machine and electrical expenses            | 12           | 20            | 22            | 18           | 44            | 15           | 26            | 30            | 40            | 40            |
| 24 | Corporate Social Responsibility                  | 3            | 2             | 5             | 4            | 9             | 3            | 6             | 11            | 9             | 9             |
| 25 | Other expenses                                   | 59           | 47            | 105           | 127          | 267           | 52           | 92            | 270           | 714           | 714           |
| 26 | Gas Kiln Collector Charges                       | -            | -             | -             | -            | -             | 594          | 660           | 594           | 660           | 660           |
| 27 | KMI Implementation Plan / LPS Control Activities | -            | -             | -             | -            | 1,307         | -            | -             | 1,307         | -             | -             |
| 28 | Gathering charges of collection data             | -            | -             | -             | -            | -             | 59           | 65            | 59            | 7             | 7             |
| 29 | Disposal of Gas Bills                            | -            | -             | -             | -            | -             | 149          | 165           | 149           | 17            | 17            |
| 30 | Provision for doubtful debts                     | -            | -             | -             | -            | -             | 1,028        | 1,843         | 1,028         | 815           | 815           |
| 31 | Gas Internally consumed - Indigenes              | 3,285        | 6,675         | 7,960         | -            | -             | -            | -             | 1,285         | 6,675         | 6,675         |
| 32 | Allocation to CWP (Others)                       | 6,537        | 10,853        | 17,408        | 9,157        | 15,311        | 8,190        | 10,003        | 23,206        | 20,828        | 20,828        |
|    | <b>Net Operating Budget</b>                      | <b>6,557</b> | <b>10,853</b> | <b>17,408</b> | <b>9,002</b> | <b>15,093</b> | <b>8,367</b> | <b>10,463</b> | <b>23,726</b> | <b>22,677</b> | <b>22,677</b> |

**Basis of Allocations :**

1. Estimated Revenue Requirement for FY 2021-22 has been adapted to Transmission, Distribution and Selling functions on the basis of departmental costs.
2. Head Office cost has been allocated to Transmission, Distribution and Selling functions on proportional basis before allocating expenses under the heads Gas bill collector, gathering charges, gathering charges, provision for doubtful debt and GIC.
3. Estimated Revenue Requirement for FY 2021-22 has been allocated to Indigenes and RLNG functions on the basis of projected sales volume.
4. Expenses under the heads Dispatch of gas bills, gathering charges, Gas bill collection charges, and provision for doubtful debts are fully charged to Selling function whereas GIC is fully charged to Transmission Function.
5. LPS Control activities are fully charged to Indigenes Function.
6. OSRA fee has been allocated to Indigenes and RLNG on the basis of annual turnover and accordingly charged to sales function.

SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[3.1] - T&D Cost Variance

| Rupees In Million                        |                        |                    |                   |                      | Remarks |
|------------------------------------------|------------------------|--------------------|-------------------|----------------------|---------|
| Description                              | Petition<br>FY 2021-22 | DERR<br>FY 2018-21 | NER<br>FY 2019-20 | Actual<br>FY 2019-20 |         |
| <b>1 Salaries &amp; Wages</b>            |                        |                    |                   |                      |         |
| <b>Executives</b>                        |                        |                    |                   |                      |         |
| Salaries & allowances                    |                        |                    |                   |                      |         |
| Salaries                                 | 6,054                  | 2,482              | 4,535             | 4,313                |         |
| Gratuity                                 | 297                    | 122                | 222               | 211                  |         |
| Pension                                  | 612                    | 254                | 458               | 434                  |         |
| E.O.B.I                                  | 19                     | 8                  | 19                | 9                    |         |
| Long service Award                       | 34                     | 7                  | 5                 | 5                    |         |
| Housing and accommodations               | 1                      | 0                  | 2                 | (0)                  |         |
| Insurance (staff related)                | 27                     | 14                 | 35                | 18                   |         |
| tea / coffee                             | 32                     | 15                 | 28                | 23                   |         |
| Club membership/subscription             | 15                     | 13                 | 20                | 3                    |         |
| C.F.C Petrol                             | 45                     | 30                 | 46                | 39                   |         |
| Others Welfare Exec.                     | 6                      | 4                  | 7                 | 4                    |         |
| Incremental Impact of IAS-19             | 7,142<br>(298)         | 2,949<br>(51)      | 5,377             | 5,059<br>(12)        |         |
|                                          | <b>6,844</b>           | <b>2,898</b>       | <b>5,377</b>      | <b>5,047</b>         |         |
| <b>Medical &amp; Welfare</b>             |                        |                    |                   |                      |         |
| Medical expenses - Executives            | 265                    | 134                | 225               | 222                  |         |
| Medical expenses - Parents               | 108                    | 44                 | 87                | 90                   |         |
| Incremental Impact of IAS-19             | 92                     | 92                 | -                 | 178                  |         |
|                                          | <b>465</b>             | <b>271</b>         | <b>313</b>        | <b>490</b>           |         |
| <b>Total Executive cost</b>              | <b>7,308</b>           | <b>3,169</b>       | <b>5,689</b>      | <b>5,537</b>         |         |
| <b>Subordinates</b>                      |                        |                    |                   |                      |         |
| Wages & allowances                       |                        |                    |                   |                      |         |
| Wages                                    | 10,457                 | 4,978              | 8,351             | 9,344                |         |
| Bonus -(10-C, Agreement, Performance)    | 985                    | 404                | 844               | 764                  |         |
| Overtime (including dinner/breakfast/con | 1,108                  | 495                | 875               | 1,121                |         |

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[3.1] - T&D Cost Variance

| Description                                 | Rupees in Million      |                    |                    |                      |              | Remarks |
|---------------------------------------------|------------------------|--------------------|--------------------|----------------------|--------------|---------|
|                                             | Pakistan<br>FY 2021-22 | DERR<br>FY 2020-21 | REMR<br>FY 2019-20 | Actual<br>FY 2018-19 |              |         |
| Badli/casual labour                         | 1,625                  | 832                | 1,530              | 1,317                |              |         |
| Gratuity                                    | 356                    | 174                | 264                | 307                  |              |         |
| Pension                                     | 842                    | 410                | 670                | 729                  |              |         |
| E.O.B.I                                     | 146                    | 58                 | 132                | 63                   |              |         |
| Long service Award                          | 3                      | 4                  | 2                  | 2                    |              |         |
| L.F.A                                       | 90                     | 51                 | 90                 | 63                   |              |         |
| Insurance (staff related)                   | 35                     | 17                 | 61                 | 21                   |              |         |
| Sundry welfare Staff                        | 30                     | 15                 | 28                 | 24                   |              |         |
| Uniform Clothing                            | 10                     | 4                  | 7                  | 7                    |              |         |
| Haji Expenses                               | 61                     | 41                 | 64                 | 45                   |              |         |
| Workers children education cess             | 1                      | 1                  | 1                  | 1                    |              |         |
| Impact of CBA Agreement                     | 15,751                 | 7,483              | 12,940             | 13,807               |              |         |
| Incremental Impact of IAS-19                | 4,687                  | 307                | 291                | 90                   |              |         |
|                                             | 20,859                 | 7,790              | 13,231             | 13,897               |              |         |
| <b>Medical &amp; Welfare</b>                |                        |                    |                    |                      |              |         |
| Medical expenses - Staff                    | 667                    | 282                | 519                | 509                  |              |         |
| Medical expenses - Parents                  | 160                    | 93                 | 164                | 170                  |              |         |
| Maternity allowance - Subordinate           | 7                      | 3                  | 5                  | 3                    |              |         |
| Incremental Impact of IAS-19                | 834                    | 377                | 687                | 683                  |              |         |
|                                             | 45                     | 36                 | 360                | 72                   |              |         |
|                                             | 879                    | 413                | 1,047              | 754                  |              |         |
| <b>Total Subordinate cost</b>               | 21,738                 | 8,203              | 14,278             | 14,551               |              |         |
| Free Gas Facility (Previously part of GIC)  | 276                    | 139                | 319                | 329                  |              |         |
| <b>Total Executive and Subordinate cost</b> | 29,322                 | 11,510             | 20,286             | 20,517               | HA Benchmark |         |

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**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**(3.1) - T&D Cost Variance**

Rupees in Million

| Description                                   | Petition     |              | DEEM       |              | ASMA       |              | Actual | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|--------------|--------------|------------|--------------|------------|--------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | FY 2021-22   | FY 2020-21   | FY 2020-21 | FY 2019-20   | FY 2019-20 | FY 2019-20   |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>2 Gas Internally Consumed</b>              |              |              |            |              |            |              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Indigenous                                    | 1,285        | 1,288        |            | 1,216        |            | 543          |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| RLNG                                          | 6,675        | 5,105        |            | 8,056        |            | 4,111        |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                               | <b>7,960</b> | <b>6,393</b> |            | <b>9,272</b> |            | <b>4,654</b> |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>3 Stores, Spares and Supplies Consumed</b> |              |              |            |              |            |              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Compression                                   | 237          | 230          |            | 182          |            | 126          |        | The actual expense of FY 2019-20 is not the true representation of expenses due to COVID-19.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Transmission                                  | 349          | 293          |            | 210          |            | 145          |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Distribution                                  | 322          | 198          |            | 398          |            | 154          |        | 10% normal inflation has been assumed for 3 years on actual expense FY 2018-19 i.e. Rs. 719 million to project the proposed amount. It is also pertinent to mention here that the proposed amount is only 12% over expense allowed by the Authority for FY 2019-20. It is requested that the increase may be allowed considering the increasing prices of spares due to devaluation of PKR as compared to USD as most of store stock items are imported and have higher values as compared to the preceding years. |
| Others (incl H.O.)                            | 4            | 4            |            | 12           |            | 5            |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Freight & handling                            | 88           | 75           |            | 90           |            | 55           |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                               | <b>1,000</b> | <b>800</b>   |            | <b>892</b>   |            | <b>484</b>   |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>4 Repairs &amp; Maintenance</b>            |              |              |            |              |            |              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Compression                                   | 23           | 19           |            | 24           |            | 17           |        | Proposed amount includes Rs. 200 million for recoating activities. It is to inform that Recoating activities could not be carried out in FY 2019-20 due to non availability of coating material. The manufacturing of coal tar enamel had been discontinued worldwide due to its carcinogenic properties and no renowned manufacturers are available globally. The recoating works are now scheduled during fiscal year 2020-21 with Cold applied polymeric tapes against which budget is essentially required.    |
| Transmission                                  | 287          | 84           |            | 137          |            | 44           |        | An additional amount of Rs. 25 million proposed by Telecom for SCAUA.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Distribution                                  | 1,090        | 645          |            | 1,001        |            | 861          |        | Proposed budget is only 9% over and above the budget allowed by the Authority for FY 2019-20. It is worth mentioning here that the contractor rates have not been revised since July 2017. The projected amount include impact of 25% expected revision in schedule rates of contractors.                                                                                                                                                                                                                          |

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[B.1] - T&D Cost Variance

Rupees in Million

| Description                                                                           | Petition<br>FY 2021-22 | DSMR<br>FY 2020-21 | HEER<br>FY 2019-20 | Actual<br>FY 2019-20 | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------|------------------------|--------------------|--------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Others (incl H.O. & service depts.)                                                   | 361                    | 174                | 190                | 241                  | The existing agreements for the Janitorial services are Rs. 150 million as compared to the actual expenses of Rs. 123 million for FY 2018-19 and Rs 115 million for FY 2019-20.<br>Proposed amount includes additional Rs. 16 million as against Quality Assurance Programs (QAP) approved by the Management. Further, the additional impact is for increase in inflation rate and expected revision in Contractor's schedule rates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Computer (Software/Hardware) Repairs<br>& Maintenance / (Service level<br>Agreements) | 500                    | 174                | 228                | 357                  | IT infrastructure mainly consists of<br>• Software Licenses (Oracle, Microsoft, VMWare, Antivirus, Azure's Convergence etc.)<br>• Hardware (Servers, Storage, UPS, HMIU)<br>• Data Centre (Head office & Manga)<br>• Network (Core Routers, Core Switches, Firewalls etc.)<br>• Click Charges (Monthly Gas Bill Printing Cost)<br>The above requires support from OEM.<br>The Hardware & Software are procured along with support services. The number of consumers is also growing continuously, which also increases the click charges (monthly Gas Bill printing) cost. The IT network infrastructure has also increased due to increased Regions / Locations. The cost of services is increasing every year due to inflation. Proposed amount mainly includes Annual Support of Oracle CC&B and ERP licenses, SLAs of Data centers, storage and networking equipment etc. Majority of these payments are made in USD and due to a tender of Rs. 44 million pertaining to FY 2019-20 could not be processed due to COVID-19, therefore actual expense remain understated.<br>10% Increase over actual FY 2019-20 (Rs. 400 million) is being projected by assuming 10% inflation for 2 years to cater the expected increase in USD as compared to PKR. |
|                                                                                       | 2,262                  | 1,096              | 1,580              | 1,519                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**[3.1] - T&D Cost Variance**

*Rupees in Million*

| Description |                                           | Petition<br>FY 2021-22 | BARR<br>FY 2020-21 | BARR<br>FY 2019-20 | Actual<br>FY 2019-20 | Remarks                                                                                                                                                                                   |
|-------------|-------------------------------------------|------------------------|--------------------|--------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>5</b>    | <b>Fuel &amp; Power</b>                   |                        |                    |                    |                      |                                                                                                                                                                                           |
|             | Compression                               | 26                     | 12                 | 13                 | 25                   |                                                                                                                                                                                           |
|             | Transmission                              | 194                    | 112                | 112                | 161                  |                                                                                                                                                                                           |
|             | Distribution                              | 289                    | 230                | 231                | 230                  |                                                                                                                                                                                           |
|             | Others (incl Co-Generation)               | 41                     | 43                 | 45                 | 54                   | The budgeted amount includes Rs. 30 million on account of GIC used in distribution offices. Rest is 10% normal increase.                                                                  |
|             |                                           | <b>550</b>             | <b>397</b>         | <b>401</b>         | <b>469</b>           |                                                                                                                                                                                           |
| <b>6</b>    | <b>Stationery, Telegram and Postage</b>   |                        |                    |                    |                      |                                                                                                                                                                                           |
|             | Compression                               | 2                      | 1                  | 1                  | 1                    |                                                                                                                                                                                           |
|             | Transmission                              | 7                      | 5                  | 5                  | 4                    | Projected amount includes Rs. 130 million for 'gas bill papers' as against Rs. 111 million actual for FY 2019-20 due to increase in consumer base.                                        |
|             | Distribution                              | 30                     | 24                 | 33                 | 17                   | Moreover, due to devaluation of Pak Rupee against US Dollar over the years, the prices of toner cartridges, paper rims and other stationery items have also been increased significantly. |
|             | Others (incl HO & service depts.)         | 200                    | 170                | 155                | 169                  |                                                                                                                                                                                           |
|             |                                           | <b>239</b>             | <b>200</b>         | <b>204</b>         | <b>190</b>           |                                                                                                                                                                                           |
| <b>7</b>    | <b>Dispatch of gas bills</b>              | <b>165</b>             | <b>150</b>         | <b>140</b>         | <b>133</b>           |                                                                                                                                                                                           |
| <b>8</b>    | <b>Rent, Rates, Electricity and Taxes</b> |                        |                    |                    |                      |                                                                                                                                                                                           |
|             | Rent Offices                              | 351                    | 277                | 247                | 276                  | It is submitted that that current agreements with landlords stands at Rs. 317 million. The proposed amount is based on current agreements plus 10% expected increase in agreements.       |
|             | Royalty/ Internet services                | 49                     | 47                 | 45                 | 41                   |                                                                                                                                                                                           |
|             | Telephone                                 | 48                     | 44                 | 50                 | 41                   |                                                                                                                                                                                           |

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(3.1) - T&D Cost Variance

Rupees in Million

Rupees in Million

| Description                              | Period     | ISRR       | ASRA       | Actual     | Remarks                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|------------|------------|------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | FY 2021-22 | FY 2020-21 | FY 2019-20 | FY 2019-20 |                                                                                                                                                                                                                                                                                                                                                            |
| Electricity                              | 210        | 156        | 165        | 177        | The actual expense of FY 2019-20 is not the true representation of expenses due to COVID-19. It is submitted that the operations of the Company were adversely affected due to COVID-19. Major activities were reduced to limited staff owing staff rotation policy during pandemic situation and resultantly the expenses remain lesser than anticipated. |
| Pakistan Railway (line crossing charges) | 64         | -          | -          | -          | Payments to be made to Pakistan Railway/NHA (line crossing charges) pertaining to FY 2021-22.                                                                                                                                                                                                                                                              |
| Water Conservancy                        | 6          | 5          | 6          | 6          |                                                                                                                                                                                                                                                                                                                                                            |
| Vehicles rates and taxes                 | 15         | 12         | 18         | 13         |                                                                                                                                                                                                                                                                                                                                                            |
| Others                                   | 7          | 6          | 0.15       | 5          |                                                                                                                                                                                                                                                                                                                                                            |
|                                          | 750        | 548        | 541        | 560        |                                                                                                                                                                                                                                                                                                                                                            |
| 9 Travelling                             |            |            |            |            |                                                                                                                                                                                                                                                                                                                                                            |
| Local travelling                         |            |            |            |            |                                                                                                                                                                                                                                                                                                                                                            |
| Executives                               | 104        | 91         | 91         | 89         |                                                                                                                                                                                                                                                                                                                                                            |
| Subordinates                             | 79         | 60         | 60         | 60         |                                                                                                                                                                                                                                                                                                                                                            |
| Sub Total                                | 182        | 151        | 151        | 150        |                                                                                                                                                                                                                                                                                                                                                            |
| Conveyance ( official)                   | 17         | 10         | 10         | 11         | It is submitted that the operations of the Company were adversely affected due to COVID-19. Major activities were reduced to limited staff owing staff rotation policy during pandemic situation and resultantly the expenses remain lesser than anticipated.                                                                                              |
| Foreign Travelling                       | 2          | -          | -          | -          |                                                                                                                                                                                                                                                                                                                                                            |
| Travelling Directors/ Govt. officials    | 2          | 2          | 2          | 1          |                                                                                                                                                                                                                                                                                                                                                            |
|                                          | 203        | 163        | 163        | 162        |                                                                                                                                                                                                                                                                                                                                                            |
| 10 Transport                             |            |            |            |            |                                                                                                                                                                                                                                                                                                                                                            |
| Compression                              | 23         | 14         | 14         | 25         | Company's actual expense for FY 2019-20 Rs. 920 million remained understated due to COVID-19 while expenses for FY 2018-19 was Rs. 1,007 million;                                                                                                                                                                                                          |
| Transmission                             | 206        | 118        | 118        | 184        | Proposed budget includes 5% anticipated increase in petrol prices as compared to the preceding year as well as impact of proposed revision in hiring charges of vehicles.                                                                                                                                                                                  |
| Distribution                             | 618        | 500        | 500        | 469        | An additional amount of Rs. 25-30 million annually [for 2 years] would be required for scanning of whole network.                                                                                                                                                                                                                                          |
| Others (incl HO & service depts.)        | 317        | 178        | 178        | 242        |                                                                                                                                                                                                                                                                                                                                                            |
|                                          | 1,165      | 810        | 810        | 920        |                                                                                                                                                                                                                                                                                                                                                            |

SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[3.1] - T&D Cost Variance

Rupees in Million

| Description                                                                       | Petition   |            |            | RERR       |            |            | Remarks |
|-----------------------------------------------------------------------------------|------------|------------|------------|------------|------------|------------|---------|
|                                                                                   | FY 2021-22 | FY 2020-21 | FY 2019-20 | FY 2019-20 | FY 2019-20 | FY 2019-20 |         |
| <b>11 Insurance</b>                                                               |            |            |            |            |            |            |         |
| Third party                                                                       | 3          | 3          | 3          | 3          | 2          |            |         |
| Fire risk                                                                         | 225        | 174        | 145        | 167        |            |            |         |
| Fidelity / cash in transit                                                        | 3          | 3          | 2          | 0          |            |            |         |
| Motor vehicles                                                                    | 90         | 85         | 80         | 66         |            |            |         |
| Loss of Profit                                                                    | -          | -          | -          | -          |            |            |         |
| Miscellaneous                                                                     | 9          | 6          | 5          | 10         |            |            |         |
|                                                                                   | 330        | 270        | 235        | 245        |            |            |         |
| <b>12 Legal and professional charges</b>                                          |            |            |            |            |            |            |         |
| Legal                                                                             | 291        | 185        | 145        | 194        |            |            |         |
| Professional                                                                      | 22         | 25         | 25         | 18         |            |            |         |
| Tax                                                                               | 8          | 9          | 9          | 14         |            |            |         |
| Audit                                                                             | 10         | 9          | 9          | 8          |            |            |         |
| Apprenticeship/Scholarship                                                        | 15         | 12         | 12         | 8          |            |            |         |
| Others                                                                            | 4          | 3          | 3          | 3          |            |            |         |
|                                                                                   | 350        | 242        | 203        | 245        |            |            |         |
| <b>13 Consultancy for ISO 14001: 2004 &amp; OHSAS 18000: 1999 Certifications.</b> | 9          | 5          | 5          | 4          |            |            |         |
| <b>14 Provision for doubtful debts</b>                                            | 1,843      | 728        | 1,539      | 1,854      |            |            |         |
| <b>15 Gas Bills Collection Charges</b>                                            | 660        | 600        | 540        | 539        |            |            |         |
| <b>16 Gathering charges on Bills Collection dat:</b>                              | 65         | 55         | 55         | 41         |            |            |         |
| <b>17 OGRA Fee</b>                                                                | 371        | 432        | 291        | 290        |            |            |         |

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[3.1] - T&D Cost Variance

Rupees in Million

| Description                                                               | Petition<br>FY 2021-22 | DERR<br>FY 2020-21 | Revised<br>FY 2020-21 | Actual<br>FY 2019-20 | Remarks                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------|------------------------|--------------------|-----------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>18 Advertisement</b>                                                   | 253                    | 206                | 198                   | 235                  | Nominal increase of 8% over actual for FY 2019-20 is due to inflation impact for FY 2020-21 and FY 2021-22. In compliance with OGRA licensing rule regarding winter campaign on print and electronic media, rise in budget is requested.                             |
| <b>19 Security expenses:</b>                                              |                        |                    |                       |                      |                                                                                                                                                                                                                                                                      |
| Security forces                                                           | 1,413                  | 733                | 670                   | 916                  | Additional Rs. 360 million is on account of security arrangements for Sawan-Qadipur-ACIX segment. 15% remaining increase as compared to the actual FY 2019-20 is to cater two year inflation impact.                                                                 |
| Security guards                                                           | 440                    | 267                | 330                   | 348                  | Budget has been proposed on the basis of existing agreement with the security agencies i.e. Rs. 400 million plus 10% inflation impact.                                                                                                                               |
|                                                                           | 3,853                  | 1,000              | 1,000                 | 1,264                |                                                                                                                                                                                                                                                                      |
| <b>20 KMI Implementation Plan FY 2020-21<br/>(UGS Control Activities)</b> | 1,387                  | 636                | -                     | 947                  | The amount is essentially required for execution of different KMI's (Key Monitoring Indicators) related to theft control, measurement control, leakage control and improvement of meter testing facilities.                                                          |
| <b>21 Bank charges</b>                                                    | 10                     | 11                 | 12                    | 9                    |                                                                                                                                                                                                                                                                      |
| <b>22 Protective supplies/ Clothing</b>                                   | 96                     | 54                 | 43                    | 53                   | Company provides uniform and protective clothing to its employees as per standards set by the Company from time to time. The Authority disallowed a certain portion of the amount in FY 2020-21 due to lower actual expense for FY 2019-20 that was due to COVID-19. |
| <b>23 Staff Recruiting Expenses</b>                                       | 22                     | -                  | 4                     | 4                    | Funds required for conducting recruitment test against the vacant positions of executives and subordinates.                                                                                                                                                          |
| <b>24 Staff training Expenses</b>                                         | 62                     | 35                 | 63                    | 40                   | Training Expense includes Rs. 10 million for local Training, Rs. 25 million for Sui Northern Gas Pipelines Training Institution (SNGITI) & Rs. 27 million for Executive Development Program.                                                                         |
| <b>25 Sponsorship of chairs at Universities</b>                           | 10                     | -                  | 10                    | 8                    |                                                                                                                                                                                                                                                                      |
| <b>26 Outsourcing of Call Centre for<br/>Complaints Management</b>        | 30                     | 30                 | 27                    | 26                   | Normal increase of 9% to cover the inflation impact.                                                                                                                                                                                                                 |
| <b>27 Recovery through contractors -<br/>(Disconnected Consumers)</b>     | 60                     | 25                 | 23                    | 10                   | The commission on recovery of outstanding arrears is approx Rs 120 million. 50% amount petitioned in the light of historical data.                                                                                                                                   |

**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**[3.1] - T&D Cost Variance**

*Rupees in Million*

| Description                                         | Petition<br>FY 2021-22 | DEIR<br>FY 2020-21 | DESR<br>FY 2019-20 | Actual<br>FY 2018-20 | Remarks                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------|------------------------|--------------------|--------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                     |                        |                    |                    |                      |                                                                                                                                                                                                                                                                                                                          |
| 28 Sports related activities                        | 96                     | 58                 | 48                 | 37                   | The Company has always participated actively in sports events. Similarly the Company is encouraging the sports of Squash, Hockey, Badminton, Tennis and Football. Company desires to maintain / improve its public image being a responsible corporate entity.                                                           |
| 29 Corporate Social Responsibility                  | 20                     | 10                 | 10                 | 48                   |                                                                                                                                                                                                                                                                                                                          |
| 30 Facilities Provided by other companies           | 36                     | 14                 | 10                 | 10                   | The petitioned amount is required to facilitate the Company employees and their eligible dependents posted at Sul Gas field through Service Agreement with M/s PPL where no alternative source of such service exists. The presence of Company's technical staff at well head is necessary for monitoring purposes.      |
| 31 Scanning & electronic archiving of Sales record  |                        |                    | 89                 |                      |                                                                                                                                                                                                                                                                                                                          |
| 32 Others                                           |                        |                    |                    |                      |                                                                                                                                                                                                                                                                                                                          |
| Construction equipment operating cost               | 160                    | 112                | 102                | 146                  | Normal Increase                                                                                                                                                                                                                                                                                                          |
| Subscriptions                                       | 4                      | 3                  | 3                  | 3                    |                                                                                                                                                                                                                                                                                                                          |
| Newspapers, books & periodicals                     | 7                      | 7                  | 6                  | 3                    |                                                                                                                                                                                                                                                                                                                          |
| Board meetings & directors' expenses                | 90                     | 32                 | 29                 | 70                   |                                                                                                                                                                                                                                                                                                                          |
| Stock exchange fee                                  | 4                      | 4                  | 4                  | 3                    |                                                                                                                                                                                                                                                                                                                          |
| Entertainment expenses                              | 12                     | 12                 | 11                 | 6                    |                                                                                                                                                                                                                                                                                                                          |
| Outside services employed - govt./ local authority  | 3                      | 0                  | 0                  | (0)                  |                                                                                                                                                                                                                                                                                                                          |
| Sundries                                            | 23                     | 19                 | 40                 | 15                   |                                                                                                                                                                                                                                                                                                                          |
| CNIC verification                                   | 13                     | 14                 | 17                 | 8                    |                                                                                                                                                                                                                                                                                                                          |
| Pilot Project - Digital Meters                      |                        | -                  | 13                 |                      |                                                                                                                                                                                                                                                                                                                          |
| Cost of gas blown off due to sabotage act           | 200                    |                    |                    |                      | Rs. 200 million proposed for 'cost of gas blown off' on the basis of trend of actual expenses i.e. Rs. 214 million & Rs. 161 million for FY 2019-20 & 2018-19 respectively. Historically this budget has never been proposed at ERR level, however being proposed now due to absolute budgetary control on this expense. |
| <b>TOTAL OPERATING COST</b>                         | <b>516</b>             | <b>203</b>         | <b>225</b>         | <b>254</b>           |                                                                                                                                                                                                                                                                                                                          |
| <b>Less: Allocated to Fixed Capital expenditure</b> | <b>51,693</b>          | <b>26,681</b>      | <b>38,920</b>      | <b>35,761</b>        |                                                                                                                                                                                                                                                                                                                          |
| <b>Net Operating Cost</b>                           | <b>46,405</b>          | <b>26,326</b>      | <b>35,111</b>      | <b>31,899</b>        |                                                                                                                                                                                                                                                                                                                          |

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SUI NORTHERN GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

[9] - ESTIMATED PAYMENT OF MARKUP ON LOANS

| Sr. # | Loan Details                                                              | Loan Amount (Rs.)  | Markup / Interest Rate                                                                                      | Estimated Markup<br>"2021-22" |
|-------|---------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1     | Short Term Running Finance<br>(For Working Capital Requirement)           | 10,000,000,000.000 | 3 month Kibor + 0.45% (4 Billion)<br>2 month Kibor + 0.45% (4 Billion)<br>3 month Kibor + 0.25% (2 Billion) | \$75,200,000.000              |
| 2     | Short Term Running Finance<br>(For Meeting the Payment of RLNG Suppliers) | 20,000,000,000.000 | 3 month Kibor + 0.50% (13.3 Billion)<br>1 month Kibor + 0.50% (6.5 Billion)                                 | 1,766,450,000.000             |
| Total |                                                                           | 30,000,000,000.000 |                                                                                                             | 2,641,650,000.000             |

\* The calculation of markup on loans are calculated on the basis of latest Kibor rates + 1 dated on 20.11.2020

SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[7] - OPERATING FIXED ASSETS (WOMAGAL+LNG)

Total Assets

| Description                 | Cost                     |                    |                  |                           | Depreciation             |                          |                             | Book Value of Assets as on 30-06-2022 |                          | Depreciation Rate % age |
|-----------------------------|--------------------------|--------------------|------------------|---------------------------|--------------------------|--------------------------|-----------------------------|---------------------------------------|--------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deduction during the Year | Balance as on 30-06-2022 | Balance as on 01-07-2021 | Depreciation for the Period | Adjustments                           | Balance as on 30-06-2022 |                         |
| LAND FREEHOLD               | 2,804                    | -                  | -                | 3                         | 2,807                    | -                        | -                           | -                                     | 2,807                    | 0                       |
| LAND LEASEHOLD              | 0                        | -                  | -                | -                         | 0                        | -                        | -                           | -                                     | 0                        | 0                       |
| BUILDING ON FREEHOLD LAND   | 4,432                    | -                  | 300              | -                         | 4,732                    | 1,571                    | 155                         | -                                     | 1,726                    | 6                       |
| BUILDING ON LEASEHOLD LAND  | 45                       | -                  | -                | -                         | 35                       | 10                       | 2                           | -                                     | 20                       | 6                       |
| TRANSMISSION MANS           | 170,925                  | -                  | 1,918            | -                         | 172,843                  | 64,852                   | 7,313                       | -                                     | 73,165                   | 6                       |
| DISTRIBUTION MANS           | 147,298                  | -                  | 89,354           | -                         | 236,652                  | 63,680                   | 10,916                      | -                                     | 74,596                   | 6                       |
| COMPRESSOR STATION EQUIP    | 16,998                   | -                  | 576              | -                         | 17,574                   | 10,206                   | 1,037                       | -                                     | 142,007                  | 6                       |
| TELECOMMUNICATION EQUIPMENT | 2,208                    | -                  | 41               | -                         | 2,252                    | 2,001                    | 87                          | -                                     | 11,323                   | 6                       |
| PLANT AND MACHINERY         | 4,370                    | -                  | 1,322            | -                         | 5,692                    | 3,522                    | 940                         | -                                     | 2,069                    | 6                       |
| MEASURING AND REGULATING    | 66,189                   | -                  | 15,637           | -                         | 81,825                   | 36,918                   | 7,404                       | -                                     | 1,431                    | 20                      |
| TOOLS AND EQUIPMENT         | 422                      | -                  | 42               | -                         | 464                      | 359                      | 30                          | -                                     | 37,564                   | 10                      |
| MOTOR VEHICLES              | 9,854                    | -                  | 224              | -                         | 10,078                   | 3,826                    | 250                         | -                                     | 429                      | 21                      |
| CONSTRUCTION EQUIPMENT      | 9,086                    | -                  | 551              | -                         | 9,637                    | 8,816                    | 326                         | -                                     | 196                      | 25                      |
| FURNITURE & FIXTURES        | 776                      | -                  | 71               | -                         | 847                      | 704                      | 66                          | -                                     | 9,141                    | 20                      |
| OFFICE EQUIPMENTS           | 322                      | -                  | 41               | -                         | 363                      | 192                      | 35                          | -                                     | 770                      | 15                      |
| COMPUTER HARDWARE           | 2,486                    | -                  | 622              | -                         | 3,107                    | 2,233                    | 310                         | -                                     | 206                      | 20                      |
| COMPUTER SYSTEM SOFTWARE    | 557                      | -                  | 1                | -                         | 558                      | 537                      | 0                           | -                                     | 351                      | 33                      |
| SCADA SYSTEMS               | -                        | -                  | -                | -                         | -                        | -                        | -                           | -                                     | 557                      | 33                      |
| TOTAL                       | 380,518                  | -                  | 90,557           | -                         | 471,075                  | 189,537                  | 28,767                      | -                                     | 228,344                  | 15                      |

Intangible Assets

|  |       |   |     |   |       |     |    |   |       |    |
|--|-------|---|-----|---|-------|-----|----|---|-------|----|
|  | 1,010 | - | 106 | - | 1,105 | 951 | 66 | - | 1,017 | 33 |
|--|-------|---|-----|---|-------|-----|----|---|-------|----|

Advances for Land

|                  |     |   |   |   |     |   |   |   |   |     |
|------------------|-----|---|---|---|-----|---|---|---|---|-----|
| - Natural Assets | 191 | - | - | - | 191 | - | - | - | - | 191 |
| - LNG Assets     | 52  | - | - | - | 52  | - | - | - | - | 52  |

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Total 381,161

Depreciation Capitalized

|                                 |   |   |        |   |         |         |        |   |         |         |
|---------------------------------|---|---|--------|---|---------|---------|--------|---|---------|---------|
| - Natural Assets (Distribution) | - | - | 99,663 | - | 472,424 | 200,526 | 28,833 | - | 229,361 | 243,463 |
| - LNG Assets (Transmission)     | - | - | -      | - | -       | -       | -      | - | -       | -       |

Depreciation Charged to Expense

38,831

SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIRINGMENT  
FOR FINANCIAL YEAR 2021-22

(7) - OPERATING FIXED ASSETS (NORMAL VALUE)

Statement

| Description                 | Cost                     |                    |                  | Depreciation             |                          |                          | Book Value of Assets as on 30-06-2022 |             | Depreciation Ratio % age |
|-----------------------------|--------------------------|--------------------|------------------|--------------------------|--------------------------|--------------------------|---------------------------------------|-------------|--------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deletion during the Year | Balance as on 30-06-2022 | Balance as on 01-07-2021 | Depreciation for the Period           | Adjustments | Balance as on 30-06-2022 |
| LAND FRECHOLD               | 127                      | -                  | -                | -                        | 127                      | -                        | -                                     | -           | 127                      |
| LAND LEASEHOLD              | 0                        | -                  | -                | -                        | 0                        | -                        | -                                     | -           | 0                        |
| BUILDING ON FREEHOLD LAND   | 1,037                    | -                  | 270              | -                        | 1,307                    | 427                      | 70                                    | -           | 780                      |
| BUILDING ON LEASEHOLD LAND  | 35                       | -                  | -                | -                        | 35                       | 18                       | 2                                     | -           | 15                       |
| TRANSMISSION MANS           | 1,355                    | -                  | -                | -                        | 1,355                    | 010                      | 83                                    | -           | 483                      |
| DISTRIBUTION MANS           | 247,293                  | -                  | 69,344           | -                        | 316,637                  | 63,052                   | 20,912                                | -           | 74,964                   |
| COMPARATORS STATION EQUIP   | 75                       | -                  | -                | -                        | 75                       | 64                       | 5                                     | -           | 69                       |
| TELECOMMUNICATION EQUIPMENT | 510                      | -                  | 46               | -                        | 554                      | 193                      | 32                                    | -           | 129                      |
| PLANT AND MACHINERY         | 2,005                    | -                  | 735              | -                        | 2,739                    | 1,408                    | 474                                   | -           | 1,913                    |
| MILASURING AND REGULATING   | 66,187                   | -                  | 15,607           | -                        | 81,794                   | 36,700                   | 7,401                                 | -           | 44,301                   |
| TOOLS AND EQUIPMENT         | 771                      | -                  | 40               | -                        | 815                      | 250                      | 72                                    | -           | 281                      |
| MOTOR VEHICLES              | 2,045                    | -                  | 224              | -                        | 2,269                    | 1,021                    | 153                                   | -           | 1,174                    |
| CONSTRUCTION EQUIPMENT      | 2,110                    | -                  | 546              | -                        | 2,655                    | 1,904                    | 270                                   | -           | 2,174                    |
| FURNITURE & FIXTURES        | 370                      | -                  | 74               | -                        | 443                      | 317                      | 62                                    | -           | 380                      |
| OFFICE EQUIPMENTS           | 157                      | -                  | 41               | -                        | 198                      | 124                      | 33                                    | -           | 156                      |
| COMPUTER HARDWARE           | 629                      | -                  | 27               | -                        | 656                      | 584                      | 30                                    | -           | 614                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                  | -                | -                        | -                        | -                        | -                                     | -           | -                        |
| SCADA SYSTEMS               | 305                      | -                  | 1                | -                        | 306                      | 305                      | 0                                     | -           | 305                      |
| TOTAL                       | 224,389                  | -                  | 87,043           | -                        | 311,430                  | 148,969                  | 19,548                                | -           | 128,519                  |
| Intangible Assets           | 374                      | -                  | 96               | -                        | 471                      | 368                      | 23                                    | -           | 390                      |
| Advances for land           | -                        | -                  | -                | -                        | -                        | -                        | -                                     | -           | -                        |
| - Normal Assets             | -                        | -                  | -                | -                        | -                        | -                        | -                                     | -           | -                        |
| - Intangible Assets         | -                        | -                  | -                | -                        | -                        | -                        | -                                     | -           | -                        |
| Total                       | 224,762                  | -                  | 87,139           | -                        | 311,901                  | 149,333                  | 19,570                                | -           | 128,903                  |
|                             |                          |                    |                  |                          |                          |                          |                                       |             | 181,998                  |

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7) - OPERATING FIXED ASSETS (NORMAL + IINQ)

Transmission

| Description                                    | Balance as on<br>01-07-2021 | Adjustment<br>2021-22 | Addition 2021-22 | Deletions during<br>the Year | Balance as on<br>30-06-2022 | Depreciation                |             | Book Value of<br>Assets as on 30-06-2022 | Depreciation<br>Rate % ago |
|------------------------------------------------|-----------------------------|-----------------------|------------------|------------------------------|-----------------------------|-----------------------------|-------------|------------------------------------------|----------------------------|
|                                                |                             |                       |                  |                              |                             | Balance as on<br>30-06-2022 | Adjustments |                                          |                            |
| LAND FREEHOLD                                  | 2,677                       | -                     | -                | 3                            | 2,680                       | -                           | -           | 2,680                                    | 0                          |
| LAND LEASEHOLD                                 | 0                           | -                     | -                | -                            | 0                           | -                           | -           | 0                                        | 0                          |
| BUILDING ON FREEHOLD LAND                      | 1,345                       | -                     | -                | 30                           | 1,315                       | -                           | -           | 1,315                                    | 6                          |
| BUILDING ON LEASEHOLD LAND                     | -                           | -                     | -                | -                            | -                           | -                           | -           | -                                        | 6                          |
| TRANSMISSION TOWNS                             | 119,570                     | -                     | 1,918            | -                            | 121,488                     | -                           | -           | 121,488                                  | 6                          |
| DISTRIBUTION MANS                              | 35                          | -                     | -                | -                            | 35                          | -                           | -           | 35                                       | 6                          |
| COMPRESSOR STATION EQUIP                       | 16,903                      | -                     | 576              | -                            | 17,479                      | -                           | -           | 17,479                                   | 6                          |
| TR. COMMUNICATION EQUIPMENT                    | 1,640                       | -                     | -                | -                            | 1,640                       | -                           | -           | 1,640                                    | 6                          |
| PLANT AND MACHINERY                            | 2,440                       | -                     | 349              | -                            | 2,789                       | -                           | -           | 2,789                                    | 6                          |
| MEASURING AND TROVATING<br>TOOLS AND EQUIPMENT | 33                          | -                     | -                | -                            | 33                          | -                           | -           | 33                                       | 20                         |
| MOTOR VEHICLES                                 | 145                         | -                     | 1                | -                            | 146                         | -                           | -           | 146                                      | 10                         |
| CONSTRUCTION EQUIPMENT                         | 785                         | -                     | -                | -                            | 785                         | -                           | -           | 785                                      | 35                         |
| FURNITURE & FIXTURES                           | 6,939                       | -                     | 5                | -                            | 6,944                       | -                           | -           | 6,944                                    | 25                         |
| OFFICE EQUIPMENTS                              | 515                         | -                     | -                | -                            | 515                         | -                           | -           | 515                                      | 20                         |
| COMPUTER HARDWARE                              | 48                          | -                     | -                | -                            | 48                          | -                           | -           | 48                                       | 15                         |
| COMPUTER SYSTEM SOFTWARE                       | 203                         | -                     | -                | -                            | 203                         | -                           | -           | 203                                      | 20                         |
| SCADA SYSTEMS                                  | 252                         | -                     | -                | -                            | 252                         | -                           | -           | 252                                      | 34                         |
| TOTAL                                          | 154,436                     | -                     | 3,121            | -                            | 157,557                     | -                           | -           | 157,557                                  | 15                         |
| Intangible Assets                              | 1                           | -                     | -                | -                            | 1                           | -                           | -           | 1                                        | 34                         |

Advances for Land

|                 |         |   |       |   |         |   |   |         |        |
|-----------------|---------|---|-------|---|---------|---|---|---------|--------|
| - Normal Assets | 201     | - | -     | - | 191     | - | - | 191     | 191    |
| - IING Assets   | 57      | - | -     | - | 52      | - | - | 52      | 52     |
| Total           | 154,889 | - | 3,121 | - | 157,828 | - | - | 157,828 | 60,101 |

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SUI NORTHERN GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

[71 - OPERATING FIXED ASSETS (NORMAL+U/D)]

\$Miles

| Description                 | Cost                     |                    |                  |                          | Depreciation             |                          |                             | Book Value of Assets as on 30-06-2022 |                          | Depreciation Rate % age |
|-----------------------------|--------------------------|--------------------|------------------|--------------------------|--------------------------|--------------------------|-----------------------------|---------------------------------------|--------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deletion during the Year | Balance as on 30-06-2022 | Balance as on 01-07-2022 | Depreciation for the Period | Adjustments                           | Balance as on 30-06-2022 |                         |
| LAND FREEHOLD               | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 0                       |
| LAND LEASEHOLD              | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 0                       |
| BUILDING ON FREEHOLD LAND   | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 3                       |
| BUILDING ON LEASEHOLD LAND  | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 6                       |
| TRANSMISSION MANS           | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 6                       |
| DISTRIBUTION MANS           | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 6                       |
| CONSUMERS STATION EQUIP     | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 6                       |
| TELECOMMUNICATION EQUIPMENT | 58                       | -                  | -                | -                        | 58                       | 30                       | 4                           | -                                     | 39                       | 6                       |
| PLANT AND MACHINERY         | 125                      | -                  | -                | -                        | 125                      | 91                       | 25                          | -                                     | 122                      | 20                      |
| MEASURING AND REGULATING    | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 20                      |
| TOOLS AND EQUIPMENT         | 2                        | -                  | -                | -                        | 2                        | 2                        | -                           | -                                     | -                        | 10                      |
| MOTOR VEHICLES              | 123                      | -                  | -                | -                        | 123                      | 110                      | 13                          | -                                     | 119                      | 33                      |
| CONSTRUCTION EQUIPMENT      | 28                       | -                  | -                | -                        | 28                       | 28                       | -                           | -                                     | 28                       | 25                      |
| FURNITURE & FIXTURES        | 71                       | -                  | -                | -                        | 71                       | 68                       | 4                           | -                                     | 72                       | 20                      |
| OFFICE EQUIPMENTS           | 22                       | -                  | -                | -                        | 22                       | 20                       | 2                           | -                                     | 22                       | 15                      |
| COMPUTER HARDWARE           | 1,074                    | -                  | 394              | -                        | 2,068                    | 1,440                    | 290                         | -                                     | 1,739                    | 20                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 33                      |
| SCADA SYSTEMS               | -                        | -                  | -                | -                        | -                        | -                        | -                           | -                                     | -                        | 33                      |
| <b>TOTAL</b>                | <b>2,094</b>             | <b>-</b>           | <b>994</b>       | <b>-</b>                 | <b>2,488</b>             | <b>1,490</b>             | <b>328</b>                  | <b>-</b>                              | <b>2,132</b>             | <b>-</b>                |
| <b>Intangible Assets</b>    | <b>624</b>               | <b>-</b>           | <b>9</b>         | <b>-</b>                 | <b>634</b>               | <b>592</b>               | <b>43</b>                   | <b>-</b>                              | <b>616</b>               | <b>33</b>               |
| <b>Advances for Land</b>    | <b>-</b>                 | <b>-</b>           | <b>-</b>         | <b>-</b>                 | <b>-</b>                 | <b>-</b>                 | <b>-</b>                    | <b>-</b>                              | <b>-</b>                 | <b>-</b>                |
| <b>Normal Assets</b>        | <b>-</b>                 | <b>-</b>           | <b>-</b>         | <b>-</b>                 | <b>-</b>                 | <b>-</b>                 | <b>-</b>                    | <b>-</b>                              | <b>-</b>                 | <b>-</b>                |
| <b>U/D Assets</b>           | <b>-</b>                 | <b>-</b>           | <b>-</b>         | <b>-</b>                 | <b>-</b>                 | <b>-</b>                 | <b>-</b>                    | <b>-</b>                              | <b>-</b>                 | <b>-</b>                |
| <b>Total</b>                | <b>2,718</b>             | <b>-</b>           | <b>403</b>       | <b>-</b>                 | <b>3,321</b>             | <b>2,386</b>             | <b>371</b>                  | <b>-</b>                              | <b>2,757</b>             | <b>361</b>              |

SUN NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7.1) - OPERATING FIXED ASSETS, NORMALLY

## Total Assets

| Description                 | Cost                     |                    |                  |                            | Depreciation             |                             |                          | Book Value of Assets as on 30-06-2022 | Depreciation Rate % age |
|-----------------------------|--------------------------|--------------------|------------------|----------------------------|--------------------------|-----------------------------|--------------------------|---------------------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Duration starting the Year | Balance as on 30-06-2022 | Depreciation for the Period | Balance as on 30-06-2022 |                                       |                         |
| LAND (FREEHOLD)             | 2,578                    | -                  | -                | -                          | 2,581                    | -                           | -                        | 2,581                                 | 0                       |
| LAND (LEASEHOLD)            | 0                        | -                  | -                | -                          | 0                        | -                           | -                        | 0                                     | 0                       |
| BUILDING ON FREEHOLD LAND   | 2,432                    | -                  | 300              | -                          | 2,732                    | 1,571                       | 1,726                    | 1,006                                 | 6                       |
| BUILDING ON LEASEHOLD LAND  | 35                       | -                  | -                | -                          | 35                       | 18                          | 20                       | 15                                    | 6                       |
| TRANSMISSION MANS           | 65,180                   | -                  | 1,820            | -                          | 67,001                   | 51,148                      | 3,566                    | 55,114                                | 6                       |
| DISTRIBUTION MANS           | 145,682                  | -                  | 67,304           | -                          | 213,036                  | 69,530                      | 30,762                   | 74,301                                | 6                       |
| COMPRESSION STATION EQUIP   | 13,549                   | -                  | 545              | -                          | 14,125                   | 9,116                       | 770                      | 9,095                                 | 6                       |
| TELECOMMUNICATION EQUIPMENT | 2,148                    | -                  | 64               | -                          | 2,192                    | 1,975                       | 64                       | 2,038                                 | 6                       |
| PLANT AND MACHINERY         | 4,719                    | -                  | 1,322            | -                          | 5,561                    | 3,322                       | 872                      | 114                                   | 6                       |
| MEASURING AND REGULATING    | 65,137                   | -                  | 15,726           | -                          | 80,563                   | 36,719                      | 7,295                    | 1,354                                 | 20                      |
| TOOLS AND EQUIPMENT         | 374                      | -                  | 42               | -                          | 417                      | 352                         | 30                       | 44,004                                | 10                      |
| MOTOR VEHICLES              | 2,868                    | -                  | 234              | -                          | 3,092                    | 2,440                       | 156                      | 361                                   | 33                      |
| CONSTRUCTION EQUIPMENT      | 4,780                    | -                  | 351              | -                          | 5,131                    | 4,509                       | 326                      | 2,846                                 | 25                      |
| FURNITURE & FIXTURES        | 544                      | -                  | 74               | -                          | 618                      | 478                         | 66                       | 4,835                                 | 20                      |
| OFFICE EQUIPMENTS           | 213                      | -                  | 81               | -                          | 254                      | 183                         | 35                       | 545                                   | 15                      |
| COMPUTER HARDWARE           | 2,472                    | -                  | 420              | -                          | 2,892                    | 2,221                       | 320                      | 217                                   | 20                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                  | -                | -                          | -                        | -                           | -                        | 2,542                                 | 33                      |
| SCADA SYSTEMS               | 557                      | -                  | 1                | -                          | 558                      | 537                         | 0                        | -                                     | 33                      |
| TOTAL                       | 911,769                  | -                  | 88,239           | -                          | 400,048                  | 178,448                     | 24,808                   | 203,255                               | 15                      |
| Intangible Assets           | 989                      | -                  | 206              | -                          | 1,194                    | 950                         | 66                       | 1,018                                 | 36                      |

|                                                         |         |        |   |         |         |        |         |         |
|---------------------------------------------------------|---------|--------|---|---------|---------|--------|---------|---------|
| Depreciable Capitalised<br>Normal Assets (Distribution) | 812,959 | 88,345 | - | 661,304 | 179,384 | 24,873 | 204,271 | 197,032 |
|---------------------------------------------------------|---------|--------|---|---------|---------|--------|---------|---------|

SUN MOUNTAIN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7.2) - OPERATING FIXED ASSETS (continued)

2021-22

| Description                 | Cost                     |                    |                  |                          | Depreciation             |                             |             | Assets in million        |                         |
|-----------------------------|--------------------------|--------------------|------------------|--------------------------|--------------------------|-----------------------------|-------------|--------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deletion during the year | Balance as on 01-07-2022 | Depreciation for the period | Adjustments | Balance as on 30-06-2022 | Depreciation Rate % age |
| LAND FREE-HOLD              | 127                      | -                  | -                | -                        | 127                      | -                           | -           | -                        | 0                       |
| LAND LEASEHOLD              | 0                        | -                  | -                | -                        | 0                        | -                           | -           | -                        | 0                       |
| BUILDING ON FREEHOLD LAND   | 1,037                    | -                  | 779              | -                        | 1,817                    | 70                          | -           | 547                      | 6                       |
| BUILDING ON LEASEHOLD LAND  | 15                       | -                  | -                | -                        | 35                       | 2                           | -           | 20                       | 6                       |
| TRANSMISSION MANS           | 1,355                    | -                  | -                | -                        | 1,355                    | 81                          | -           | 692                      | 6                       |
| DISTRIBUTION MANS           | 143,546                  | -                  | 67,394           | -                        | 210,940                  | 10,758                      | -           | 74,269                   | 6                       |
| COMPRESSOR STATION EQUIP    | 75                       | -                  | -                | -                        | 75                       | 5                           | -           | 69                       | 6                       |
| TELECOMMUNICATION EQUIPMENT | 510                      | -                  | 44               | -                        | 554                      | 32                          | -           | 425                      | 6                       |
| PLANT AND MACHINERY         | 2,025                    | -                  | 733              | -                        | 2,758                    | 474                         | -           | 1,813                    | 20                      |
| MEASURING AND REGULATING    | 85,164                   | -                  | 15,425           | -                        | 100,589                  | 7,282                       | -           | 43,983                   | 10                      |
| TOOLS AND EQUIPMENT         | 274                      | -                  | 62               | -                        | 336                      | 22                          | -           | 281                      | 33                      |
| MOTOR VEHICLES              | 2,043                    | -                  | 224              | -                        | 2,267                    | 153                         | -           | 2,073                    | 75                      |
| CONSTRUCTION EQUIPMENT      | 2,119                    | -                  | 546              | -                        | 2,665                    | 270                         | -           | 2,174                    | 10                      |
| FURNITURE & FIXTURES        | 279                      | -                  | 74               | -                        | 353                      | 12                          | -           | 360                      | 15                      |
| OFFICE EQUIPMENTS           | 152                      | -                  | 41               | -                        | 193                      | 33                          | -           | 154                      | 30                      |
| COMPUTER HARDWARE           | 609                      | -                  | 27               | -                        | 636                      | 30                          | -           | 614                      | 33                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                  | -                | -                        | -                        | -                           | -           | -                        | 33                      |
| SCADA SYSTEMS               | 305                      | -                  | 1                | -                        | 306                      | 0                           | -           | 306                      | 15                      |
| TOTAL                       | 221,739                  | -                  | 84,822           | -                        | 306,560                  | 19,275                      | -           | 127,900                  | -                       |

|                   |     |   |    |   |     |    |   |     |    |
|-------------------|-----|---|----|---|-----|----|---|-----|----|
| Intangible Assets | 374 | - | 56 | - | 430 | 23 | - | 350 | 33 |
|-------------------|-----|---|----|---|-----|----|---|-----|----|

|                   |   |   |   |   |   |   |   |   |   |
|-------------------|---|---|---|---|---|---|---|---|---|
| Advances for Land | - | - | - | - | - | - | - | - | - |
| Normal Assets     | - | - | - | - | - | - | - | - | - |

|       |         |   |        |   |         |        |   |         |         |
|-------|---------|---|--------|---|---------|--------|---|---------|---------|
| Total | 222,113 | - | 84,918 | - | 307,031 | 19,297 | - | 128,251 | 176,740 |
|-------|---------|---|--------|---|---------|--------|---|---------|---------|

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SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7.4) - OPERATING FIXED ASSETS (NORMAL)

Transcendence

| Description                       | Cost                     |                    |                  |                              | Depreciation             |                             |             | Book Value of Assets as on 30-06-2022 | Depreciation Accumulated as on 30-06-2022 |
|-----------------------------------|--------------------------|--------------------|------------------|------------------------------|--------------------------|-----------------------------|-------------|---------------------------------------|-------------------------------------------|
|                                   | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Depreciation during the Year | Balance as on 30-06-2022 | Depreciation for the Period | Adjustments |                                       |                                           |
| LAND FILL/BLIND                   | 2,421                    | -                  | 3                | -                            | 2,424                    | -                           | -           | 2,424                                 | 0                                         |
| LAND LAYDOWN                      | 0                        | -                  | -                | -                            | 0                        | -                           | -           | 0                                     | 0                                         |
| BUILDING ON FIREHOLD LAND         | 1,395                    | -                  | 30               | -                            | 1,425                    | 85                          | -           | 1,340                                 | 6                                         |
| BUILDING UNLEASEHOLD LAND         | -                        | -                  | -                | -                            | -                        | -                           | -           | -                                     | 6                                         |
| TRANSMISSION MASTS                | 63,830                   | -                  | 1,821            | -                            | 65,656                   | 3,880                       | -           | 61,776                                | 6                                         |
| DISTRIBUTION MASTS                | 50                       | -                  | -                | -                            | 50                       | 3                           | -           | 47                                    | 6                                         |
| COMPRESSOR STATION EQUIP          | 12,674                   | -                  | 576              | -                            | 13,250                   | 700                         | -           | 12,550                                | 6                                         |
| TELECOMMUNICATION EQUIPMENT       | 1,580                    | -                  | -                | -                            | 1,580                    | 26                          | -           | 1,554                                 | 6                                         |
| PLANT AND MACHINERY               | 2,100                    | -                  | 589              | -                            | 2,689                    | 374                         | -           | 2,315                                 | 20                                        |
| MEASURING AND REGULATING          | 33                       | -                  | -                | -                            | 33                       | 3                           | -           | 30                                    | 10                                        |
| TANKS AND EQUIPMENT               | 46                       | -                  | 1                | -                            | 47                       | 8                           | -           | 39                                    | 33                                        |
| MOTOR VEHICLES                    | 713                      | -                  | -                | -                            | 713                      | -                           | -           | 713                                   | 25                                        |
| CONSTRUCTION EQUIPMENT            | 2,632                    | -                  | 3                | -                            | 2,635                    | 55                          | -           | 2,580                                 | 20                                        |
| FURNITURE & FIXTURES              | 94                       | -                  | -                | -                            | 94                       | -                           | -           | 94                                    | 15                                        |
| OFFICE EQUIPMENTS                 | 39                       | -                  | -                | -                            | 39                       | -                           | -           | 39                                    | 20                                        |
| COMPUTER HARDWARE                 | 128                      | -                  | -                | -                            | 128                      | -                           | -           | 128                                   | 13                                        |
| COMPUTER SOFTWARE                 | -                        | -                  | -                | -                            | -                        | -                           | -           | -                                     | 13                                        |
| SCADA SYSTEMS                     | 252                      | -                  | -                | -                            | 252                      | -                           | -           | 252                                   | 15                                        |
| TOTAL                             | \$7,941                  | -                  | 3,024            | -                            | \$9,966                  | \$5,203                     | -           | \$4,763                               | -                                         |
| Intangible Assets                 | -                        | -                  | -                | -                            | -                        | -                           | -           | -                                     | 33                                        |
| Advances for Land - Normal Assets | 191                      | -                  | -                | -                            | 191                      | -                           | -           | -                                     | 191                                       |
| Total                             | \$8,132                  | -                  | 3,024            | -                            | \$9,157                  | \$5,203                     | -           | \$3,954                               | 17,029                                    |

SUN NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

[7.1] - OPERATING FIXED ASSETS (JOURNAL)

Page 2

| Description                        | Cost                     |                    |               |                          | Depreciation             |                             |             | Book Value of Assets as on 30-06-2022 | Depreciation Rate % age |
|------------------------------------|--------------------------|--------------------|---------------|--------------------------|--------------------------|-----------------------------|-------------|---------------------------------------|-------------------------|
|                                    | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2022 | Deletion during the Year | Balance as on 30-06-2022 | Depreciation for the Period | Adjustments |                                       |                         |
| LAND FREEHOLD                      | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 0                       |
| LAND LEASEHOLD                     | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 0                       |
| BUILDING ON FREEHOLD LAND          | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| BUILDING ON LEASEHOLD LAND         | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| TRANSMISSION MAINS                 | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| DISTRIBUTION MAINS                 | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| COMPRESSOR STATION EQUIP           | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| TELECOMMUNICATION EQUIPMENT        | 55                       | -                  | -             | -                        | -                        | -                           | -           | -                                     | 6                       |
| PUMP AND MACHINERY                 | 123                      | -                  | -             | -                        | 58                       | 30                          | 4           | 33                                    | 5                       |
| GAUGING AND REGULATING             | -                        | -                  | -             | -                        | 103                      | 97                          | 25          | 121                                   | 2                       |
| TOOLS AND EQUIPMENT                | 2                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | 20                      |
| MOTOR VEHICLES                     | 110                      | -                  | -             | -                        | 2                        | 7                           | -           | -                                     | 10                      |
| CONSTRUCTION EQUIPMENT             | 28                       | -                  | -             | -                        | 110                      | 107                         | 3           | 2                                     | 33                      |
| FURNITURE & FIXTURES               | 71                       | -                  | -             | -                        | 28                       | 28                          | -           | 110                                   | 25                      |
| OFFICE EQUIPMENTS                  | 22                       | -                  | -             | -                        | 71                       | 67                          | 4           | 28                                    | 20                      |
| COMPUTER HARDWARE                  | 1,674                    | -                  | -             | -                        | 22                       | 20                          | 2           | 21                                    | 15                      |
| COMPUTER SYSTEM SOFTWARE           | -                        | -                  | 304           | -                        | 2,057                    | 1,448                       | 290         | 22                                    | 20                      |
| SCADA SYSTEMS                      | -                        | -                  | -             | -                        | -                        | -                           | -           | 1,784                                 | 33                      |
| TOTAL                              | 2,089                    | -                  | 384           | -                        | 2,463                    | 1,799                       | 370         | 2,127                                 | 15                      |
| Intangible Assets                  | 624                      | -                  | 9             | -                        | 633                      | 582                         | 43          | 626                                   | 33                      |
| Advances for Land - Natural Assets | -                        | -                  | -             | -                        | -                        | -                           | -           | -                                     | -                       |
| Total                              | 2,713                    | -                  | 403           | -                        | 3,116                    | 2,381                       | 371         | 2,752                                 | 364                     |

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BUJ MONTMATHIN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7.2) - DEPRECIATING FIXED ASSETS (LNG)

Total Assets

| Description                                  | Cost                     |                  |                            |                          | Depreciation             |                             |             |                          | Book Value of Assets as on 30-06-2022 | Depreciation Rate % age |
|----------------------------------------------|--------------------------|------------------|----------------------------|--------------------------|--------------------------|-----------------------------|-------------|--------------------------|---------------------------------------|-------------------------|
|                                              | Balance as on 01-07-2021 | Addition 2021-22 | Discretion during the Year | Balance as on 30-06-2022 | Balance as on 01-07-2021 | Depreciation for the Period | Adjustments | Balance as on 30-06-2022 |                                       |                         |
| LAND FILL-HOLD                               | 226                      | -                | -                          | 226                      | -                        | -                           | -           | -                        | 226                                   | 0                       |
| LAND LEASEHOLD                               | -                        | -                | -                          | -                        | -                        | -                           | -           | -                        | -                                     | 0                       |
| BUILDING ON FREEHOLD LAND                    | -                        | -                | -                          | -                        | -                        | -                           | -           | -                        | -                                     | 6                       |
| BUILDING ON LEASEHOLD LAND                   | -                        | -                | -                          | -                        | -                        | -                           | -           | -                        | -                                     | 6                       |
| TRANSMISSION MAINS                           | 55,735                   | -                | -                          | 55,735                   | 13,704                   | 3,347                       | -           | 17,051                   | 32,721                                | 6                       |
| DISTRIBUTION MAINS                           | 1,587                    | 1,060            | -                          | 3,547                    | 100                      | 754                         | -           | 294                      | 3,332                                 | 6                       |
| COMPRESSOR STATION EQUIP                     | 4,440                    | -                | -                          | 4,440                    | 1,170                    | 267                         | -           | 1,437                    | 3,003                                 | 5                       |
| TELECOMMUNICATION EQUIPMENT                  | 60                       | -                | -                          | 60                       | 27                       | 4                           | -           | 30                       | 30                                    | 6                       |
| PLANT AND MACHINERY                          | 340                      | -                | -                          | 340                      | 200                      | 68                          | -           | 238                      | 73                                    | 10                      |
| MEASURING AND REGULATING TOOLS AND EQUIPMENT | 1,263                    | 203              | -                          | 1,324                    | 159                      | 119                         | -           | 318                      | 1,005                                 | 10                      |
| MOTOR VEHICLES                               | 47                       | -                | -                          | 47                       | 47                       | -                           | -           | 47                       | -                                     | 19                      |
| CONSTRUCTION EQUIPMENT                       | 1,085                    | -                | -                          | 1,085                    | 1,085                    | -                           | -           | -                        | -                                     | 25                      |
| FURNITURE & FIXTURES                         | 4,307                    | -                | -                          | 4,307                    | 9,107                    | -                           | -           | 5,286                    | -                                     | 20                      |
| OFFICE EQUIPMENTS                            | 226                      | -                | -                          | 226                      | 236                      | 0                           | -           | 4,307                    | -                                     | 15                      |
| COMPUTER HARDWARE                            | 9                        | -                | -                          | 9                        | 9                        | 0                           | -           | 226                      | 11                                    | 20                      |
| COMPUTER SYSTEM SOFTWARE                     | 15                       | -                | -                          | 15                       | 15                       | -                           | -           | 9                        | -                                     | 33                      |
| SCADA SYSTEMS                                | -                        | -                | -                          | -                        | -                        | -                           | -           | -                        | -                                     | 13                      |
| TOTAL                                        | 69,109                   | 2,318            | -                          | 71,467                   | 23,129                   | 3,959                       | -           | 25,088                   | 66,379                                | 15                      |
| Intangible Assets                            | 1                        | -                | -                          | 1                        | 1                        | 0                           | -           | 1                        | -                                     | 33                      |
| Advances for land                            | -                        | -                | -                          | -                        | -                        | -                           | -           | -                        | -                                     | -                       |

|                   |        |       |   |        |        |       |   |        |        |   |
|-------------------|--------|-------|---|--------|--------|-------|---|--------|--------|---|
| Intangible Assets | 52     | -     | - | 52     | -      | -     | - | -      | 52     | - |
| Total             | 69,202 | 2,318 | - | 71,530 | 23,130 | 3,959 | - | 25,089 | 66,431 | - |

|                                  |   |   |   |   |   |   |   |   |   |   |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|
| Depreciation Capitalized         | - | - | - | - | - | - | - | - | - | - |
| Depreciation Charged to Expenses | - | - | - | - | - | - | - | - | - | - |

SLU NORTHERN GAS PIPELINES LIMITED  
 PERIODIC FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

[7.2] - OPERATING FIXED ASSETS (INR)

Disposition

| Description                 | Cost                     |                    |                  |                          | Depreciation             |                             | Book Value of Assets as on 30-06-2022 | Depreciation Rate % p.a. |
|-----------------------------|--------------------------|--------------------|------------------|--------------------------|--------------------------|-----------------------------|---------------------------------------|--------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deletion during the Year | Balance as on 30-06-2022 | Depreciation for the Period | Balance as on 30-06-2022              |                          |
| LAND FREEHOLD               | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| LAND LEASEHOLD              | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| BUILDING ON FREEHOLD LAND   | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| BUILDING ON LEASEHOLD LAND  | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| TRANSMISSION MAST           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| DISTRIBUTION MAST           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| COMPRESSOR STATION EQUIP    | 1,537                    | -                  | 1,980            | -                        | 3,517                    | -                           | -                                     | 0                        |
| TELECOMMUNICATION EQUIPMENT | -                        | -                  | -                | -                        | -                        | 154                         | 3,251                                 | 0                        |
| PLANT AND MACHINERY         | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| MEASURING AND REGULATING    | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| TOOLS AND EQUIPMENT         | 1,063                    | -                  | 261              | -                        | 1,324                    | -                           | -                                     | 0                        |
| TRUCKS AND VEHICLES         | -                        | -                  | -                | -                        | -                        | 119                         | -                                     | 0                        |
| CONSTRUCTION EQUIPMENT      | -                        | -                  | -                | -                        | -                        | -                           | 1,002                                 | 0                        |
| FURNITURE & FIXTURES        | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| OFFICE EQUIPMENTS           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| COMPUTER HARDWARE           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| COMPUTER SYSTEM SOFTWARE    | 0                        | -                  | -                | -                        | 0                        | -                           | 0                                     | 0                        |
| SCADA SYSTEMS               | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |
| TOTAL                       | 2,649                    | -                  | 2,221            | -                        | 4,870                    | 473                         | 613                                   | 0.258                    |
| Intangible Assets           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | -                        |
| Advances for Land           | -                        | -                  | -                | -                        | -                        | -                           | -                                     | 0                        |

- URG Assets

00000058

ALBION NORTH GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

(7.2) - OPERATING FIXED ASSETS (1,166)

Amount in million

| Description                 | Cost                     |                     |                  | Depreciation             |                             |             | Book Value of Assets at end 30-06-2022 | Depreciation Rate % Age |
|-----------------------------|--------------------------|---------------------|------------------|--------------------------|-----------------------------|-------------|----------------------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Acquisition 2021-22 | Addition 2021-22 | Balance as on 30-06-2022 | Depreciation for the Period | Adjustments |                                        |                         |
| LAND FREE HOLD              | 226                      | -                   | -                | 226                      | -                           | -           | 226                                    | 0                       |
| LAND LEASEHOLD              | -                        | -                   | -                | -                        | -                           | -           | -                                      | 0                       |
| BUILDING ON FREEHOLD LAND   | -                        | -                   | -                | -                        | -                           | -           | -                                      | 6                       |
| BUILDING ON LEASEHOLD LAND  | -                        | -                   | -                | -                        | -                           | -           | -                                      | 6                       |
| TRANSMISSION MANS           | 55,735                   | -                   | 97               | 55,832                   | 3,967                       | -           | 48,761                                 | 6                       |
| DISTRIBUTION MANS           | -                        | -                   | -                | -                        | -                           | -           | -                                      | 0                       |
| COMPREHENSIVE STATION EQUIP | 4,449                    | -                   | -                | 4,449                    | 367                         | -           | 1,437                                  | 6                       |
| COMMUNICATION EQUIPMENT     | 60                       | -                   | -                | 60                       | 4                           | -           | 30                                     | 0                       |
| PLANT AND MACHINERY         | 398                      | -                   | -                | 398                      | 63                          | -           | 267                                    | 20                      |
| MOTOR VEHICLES AND RELATING | 47                       | -                   | -                | 47                       | -                           | -           | 47                                     | 33                      |
| TOOLS AND EQUIPMENT         | 1,082                    | -                   | -                | 1,082                    | -                           | -           | 1,082                                  | 25                      |
| MOTOR VEHICLES              | 4,307                    | -                   | -                | 4,307                    | -                           | -           | 4,307                                  | 20                      |
| CONSTRUCTION EQUIPMENT      | 276                      | -                   | -                | 276                      | -                           | -           | 276                                    | 30                      |
| FURNITURE & FIXTURES        | 9                        | -                   | -                | 9                        | 0                           | -           | 9                                      | 34                      |
| OFFICE EQUIPMENTS           | 34                       | -                   | -                | 34                       | -                           | -           | 34                                     | 33                      |
| COMPUTER HARDWARE           | -                        | -                   | -                | -                        | -                           | -           | -                                      | 35                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                   | -                | -                        | -                           | -           | -                                      | -                       |
| STADA SYSTEMS               | -                        | -                   | -                | -                        | -                           | -           | -                                      | -                       |
| TOTAL                       | 66,484                   | -                   | 97               | 66,581                   | 3,986                       | -           | 42,173                                 | -                       |
| Intangible Assets           | 1                        | -                   | -                | 1                        | 0                           | -           | 1                                      | 34                      |

|                   |        |   |    |        |       |   |        |   |
|-------------------|--------|---|----|--------|-------|---|--------|---|
| Advances for Land | 52     | - | -  | 52     | -     | - | 52     | - |
| Tax Assets        | -      | - | -  | -      | -     | - | -      | - |
| Total             | 66,544 | - | 97 | 66,645 | 3,986 | - | 42,173 | - |

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SUN NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED REVENUE REQUIREMENT  
FOR FINANCIAL YEAR 2021-22

(7.2) - OPERATING FIXED ASSETS (\$ mil)

\$ mil

| Description                 | Cost                     |                    |                  | Depreciation             |                          |                          | Book Value of Assets as on 30-06-2022 | Depreciation Rate % age |
|-----------------------------|--------------------------|--------------------|------------------|--------------------------|--------------------------|--------------------------|---------------------------------------|-------------------------|
|                             | Balance as on 01-07-2021 | Adjustment 2021-22 | Addition 2021-22 | Deletion during the Year | Balance as on 30-06-2022 | Balance as on 01-07-2021 |                                       |                         |
| LAND FREIGHT                | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 0                       |
| LAND FENCE/OLD              | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 0                       |
| BUILDING ON FIEHOLD/LAND    | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 0                       |
| BUILDING ON LEASEHOLD LAND  | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 6                       |
| TRANSMISSION MINE           | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 6                       |
| DISTRIBUTION MINE           | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 6                       |
| COMPARATORS STATION SOLUP   | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 6                       |
| TELECOMMUNICATION EQUIPMENT | 1                        | -                  | -                | -                        | 1                        | 1                        | 0                                     | 20                      |
| PLANT AND MACHINERY         | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 10                      |
| MEASURING AND REGULATING    | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 33                      |
| TOOLS AND EQUIPMENT         | 4                        | -                  | -                | -                        | 4                        | 4                        | 4                                     | 75                      |
| VEHICLE                     | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 20                      |
| CONSTRUCTION EQUIPMENT      | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 15                      |
| FURNITURE & FIXTURES        | 0                        | -                  | -                | -                        | 0                        | 0                        | 0                                     | 20                      |
| OFFICE EQUIPMENTS           | 0                        | -                  | -                | -                        | 0                        | 0                        | 0                                     | 33                      |
| COMPUTER HARDWARE           | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 33                      |
| COMPUTER SYSTEM SOFTWARE    | -                        | -                  | -                | -                        | -                        | -                        | -                                     | 15                      |
| SCADA SYSTEMS               | -                        | -                  | -                | -                        | -                        | -                        | -                                     | -                       |
| TOTAL                       | 5                        | -                  | -                | -                        | 5                        | 5                        | 5                                     | 0                       |

Intangible Assets

Advances for Land

- LMS Assets

Total

00000060



SUI NORTHERN GAS PIPELINES LIMITED  
PETITION FOR ESTIMATED MONETARY REQUIREMENT  
FOR FISCAL YEAR 2011-12

7.41 - Third Assets Addition Grouping/Bifurcation

| Items/Group                                                                                           | Total         | Transmission<br>(Indigenous) | Distribution<br>(Indigenous) | Manufacturing &<br>Regulating<br>(Indigenous) | Distribution<br>(RMC) | Manufacturing &<br>Regulating<br>(RMC) |
|-------------------------------------------------------------------------------------------------------|---------------|------------------------------|------------------------------|-----------------------------------------------|-----------------------|----------------------------------------|
| Gas Distribution Mains (GDMs)                                                                         | 41,430        |                              | 45,303                       |                                               | 1,641                 |                                        |
| New Connections (Yrs. 1,200,000/Dm, 250 (lms) & 2000 (Comp))                                          | 19,200        |                              | 12,241                       | 8,379                                         | 310                   | 281                                    |
| Replacement of defective underground network systems and mains (Yrs. 820,200)                         | 2,781         |                              |                              | 2,782                                         |                       |                                        |
| Construction of BSS / DMS and Modification of Existing DRS                                            | 820           |                              |                              | 876                                           |                       |                                        |
| Construction / Upgradation / Purchase of Land for SXS                                                 | 400           | 400                          |                              |                                               |                       |                                        |
| Replacement of underground network/rehabilitation of system (SAP)                                     | 6,815         |                              | 6,300                        |                                               |                       |                                        |
| SC System                                                                                             | 432           | 372                          |                              |                                               |                       |                                        |
| GI Pipe & Fittings                                                                                    | 710           |                              | 770                          |                                               |                       |                                        |
| Installation/Replacement of GIS on operational ground                                                 | 66            |                              |                              |                                               |                       |                                        |
| Installation of gas in operational grounds                                                            | 351           |                              |                              | 65                                            |                       |                                        |
| TSS under UPs Control / Suppliers                                                                     | 1,312         |                              |                              |                                               |                       |                                        |
| Construction Equipment                                                                                | 404           |                              |                              |                                               |                       |                                        |
| Plant & Machinery                                                                                     | 31            |                              |                              |                                               |                       |                                        |
| Tool                                                                                                  | 300           |                              |                              |                                               |                       |                                        |
| Computer Software (Intangible)                                                                        | 42            |                              |                              |                                               |                       |                                        |
| Civil Construction                                                                                    | 42            |                              |                              |                                               |                       |                                        |
| Compression Equipment                                                                                 | 60            |                              |                              |                                               |                       |                                        |
| Tools & Equipment                                                                                     | 34            |                              |                              |                                               |                       |                                        |
| Luminaire & Fixture                                                                                   | 200           |                              |                              |                                               |                       |                                        |
| Pipe Equipment / Security equipment                                                                   | 304           | 143                          |                              |                                               |                       |                                        |
| Transportation                                                                                        | 44            |                              |                              |                                               |                       |                                        |
| Measuring & Regulating Equipment                                                                      | 3             |                              |                              |                                               |                       |                                        |
| Transmission Masts (Stabilization, / upgradation of Transmission spyl)                                | 210           |                              | 730                          |                                               |                       |                                        |
| Telecom equipment                                                                                     | 29            |                              |                              |                                               |                       |                                        |
| Auto (for SXS) (SXX)                                                                                  | 1,886         |                              |                              |                                               |                       |                                        |
| Construction Year II                                                                                  | 3,945         |                              |                              |                                               |                       |                                        |
| Steel implementation Plan / JFG Control Network                                                       |               |                              |                              |                                               |                       |                                        |
| GIS System (system for integration of industrial connections with SCADA system for manual monitoring) |               |                              |                              | 29                                            |                       |                                        |
| Engineering of Lapped SXS                                                                             |               |                              |                              | 1,886                                         |                       |                                        |
| Manufacturing Facility at Echford (SXS for Micro Monitoring of L-S assets)                            |               |                              |                              | 3,945                                         |                       |                                        |
| <b>Subtotal</b>                                                                                       | <b>86,686</b> | <b>895</b>                   | <b>65,031</b>                | <b>15,230</b>                                 | <b>1,950</b>          | <b>261</b>                             |

Special Projects:

|                                                                                          |               |
|------------------------------------------------------------------------------------------|---------------|
| Construction Greenfield Project (200-210)                                                | 533           |
| New Pressure Reducers in Kandari And Peshawar Regions (Kandari-Khanna-Tang) Transmission |               |
| Network System Augmentation, (Phase II)                                                  | 820           |
| Augmentation / Enhancement of Gas Networks in Lahore City (Phase-I)                      | 2,353         |
| Gas Supply project of gas infrastructure                                                 | 1,18          |
| Technical capacity building of SXS team for SXS (SXS x 2600)                             | 97            |
| Establishment of Regional Office of SXS (SXS amount)                                     | 63            |
| <b>Total Additions (As per Budget)</b>                                                   | <b>50,663</b> |

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SUN NORTHERN GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

(B) - SCHEDULE OF DEFERRED CREDIT

| Description                                  | Recoveries<br>Up to<br>June 30, 2021 | Recoveries<br>During the Period | Total Recoveries<br>Up to<br>June 30, 2022 | Rate | Accumulated<br>Amortisation<br>June 30, 2021 | Amortisation |        | Balance<br>as at<br>June 30, 2022 |
|----------------------------------------------|--------------------------------------|---------------------------------|--------------------------------------------|------|----------------------------------------------|--------------|--------|-----------------------------------|
|                                              |                                      |                                 |                                            |      |                                              | This Year    | Total  |                                   |
| Deferred Credit (Completed Jobs)             |                                      |                                 |                                            |      |                                              |              |        |                                   |
| CONSUMER CONTRIBUTION                        |                                      |                                 |                                            |      |                                              |              |        |                                   |
| TRANSMISSION                                 |                                      |                                 |                                            |      |                                              |              |        |                                   |
| RING                                         | 592                                  | 19                              | 613                                        |      | 549                                          | 57           | 579    | 39                                |
| OTHER                                        |                                      |                                 |                                            |      |                                              |              |        |                                   |
| DISTRIBUTION                                 | 1,767                                | 500                             | 2,267                                      |      | 146                                          | 121          | 367    | 1,900                             |
| RING                                         | 30,679                               | 961                             | 31,660                                     |      | 25,138                                       | 1,870        | 27,008 | 4,652                             |
| OTHER                                        |                                      |                                 |                                            |      |                                              |              |        |                                   |
|                                              | 33,048                               | 1,000                           | 34,048                                     |      | 25,927                                       | 2,028        | 27,954 | 6,580                             |
| GOVERNMENT GRANT                             |                                      | 7,118                           |                                            |      |                                              |              |        |                                   |
| TRANSMISSION                                 | 10,768                               | 1,203                           | 11,971                                     |      | 2,038                                        | 687          | 2,690  | 9,781                             |
| RING                                         | 3,849                                | 416                             | 4,265                                      |      | 2,073                                        | 243          | 2,316  | 1,940                             |
| OTHER                                        |                                      |                                 |                                            |      |                                              |              |        |                                   |
| DISTRIBUTION                                 | 23,878                               | 2,404                           | 26,467                                     |      | 10,772                                       | 1,510        | 12,281 | 14,180                            |
| RING                                         | 38,495                               | 4,203                           | 42,698                                     |      | 14,852                                       | 2,436        | 17,288 | 29,810                            |
| OTHER                                        |                                      |                                 |                                            |      |                                              |              |        |                                   |
| Total Deferred Credit against Completed Work | 71,540                               | 5,703                           | 77,243                                     |      | 40,779                                       | 4,463        | 45,242 | 32,000                            |

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SUI NORTHERN GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

[10] - Additional Revenue Requirement for LPG Air Mix Projects

| Description                   |                         | Dagsh | Ayun | Chitral | Gilgit | Total | Units       |
|-------------------------------|-------------------------|-------|------|---------|--------|-------|-------------|
| Sales Volume                  |                         |       |      |         | 2      | 8     | DDIU        |
|                               |                         |       |      |         | 5      | 5     | MMCM        |
| Sales Revenue                 | A                       |       |      |         | 11     | 11    | Rs. Million |
| Cost of gas sold              | B                       |       |      |         | 20     | 20    | Rs. Million |
| Depreciation                  | C                       |       |      |         | 53     | 53    | Rs. Million |
| Other operating cost          | D                       |       |      |         | 28     | 28    | Rs. Million |
| Operating fixed asset opening | E                       |       |      |         | 12     | 12    | Rs. Million |
| Operating fixed asset closing | F                       |       |      |         | 565    | 565   | Rs. Million |
| Avg Net Asset                 | $G = (E + F) / 2$       |       |      |         | 438    | 438   | Rs. Million |
| ROA @ 17.43%                  | $H = G \times 17.43\%$  |       |      |         | 76     | 76    | Rs. Million |
| Shortfall                     | $I = B + C + D + H - A$ |       |      |         | 167    | 167   | Rs. Million |

SUN NORTHERN GAS PIPELINES LIMITED  
 PETITION FOR ESTIMATED REVENUE REQUIREMENT  
 FOR FINANCIAL YEAR 2021-22

(A0.1) - SCHEDULE OF OPERATING FIXED ASSETS (UPG AIR MILE)

| Description                 | Balance as on<br>(01-07-2021) | Cost      |                   | Balance as on<br>(01-07-2021) | Accumulated Depreciation |                                | Back Value of<br>Assets as on 30-06-2022 | Depreciation<br>Rate % p.a. |
|-----------------------------|-------------------------------|-----------|-------------------|-------------------------------|--------------------------|--------------------------------|------------------------------------------|-----------------------------|
|                             |                               | ADDITIONS | ADDITION<br>(C/F) |                               | On Opening<br>Balance    | On Addition<br>during the year |                                          |                             |
| LAND                        | 4                             | -         | -                 | -                             | -                        | -                              | 4                                        | 0                           |
| LAND LUNCHHOLD              | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| BUILDING ON FREEHOLD LAND   | -                             | 348       | -                 | 348                           | -                        | 10                             | 317                                      | 0                           |
| BUILDING ON LEASEHOLD LAND  | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| TRAVELLERS ON MAINS         | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| DISTRIBUTION MASTS          | -                             | 240       | -                 | 240                           | -                        | 7                              | 233                                      | 0                           |
| COMMUNICATION STATION EQUIP | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| TELECOMMUNICATION EQUIPMENT | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| PLANT AND MACHINERY         | -                             | 303       | -                 | 303                           | -                        | 31                             | 278                                      | 0                           |
| VEHICLES AND REGULAR RIG    | -                             | 10        | -                 | 10                            | -                        | 1                              | 9                                        | 0                           |
| TOOLS AND EQUIPMENT         | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| TRACTOR VEHICLES            | 14                            | -         | -                 | 14                            | 7                        | -                              | 7                                        | 0                           |
| CONSTRUCTION EQUIPMENT      | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| FURNITURE & FIXTURES        | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| UTILITY TRAILERS            | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| COMPUTER HARDWARE           | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| COMPUTER SOFTWARE           | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| SWITCHGEAR                  | -                             | -         | -                 | -                             | -                        | -                              | -                                        | 0                           |
| TOTAL                       | 18                            | 907       | -                 | 925                           | 7                        | 49                             | 915                                      | 0                           |

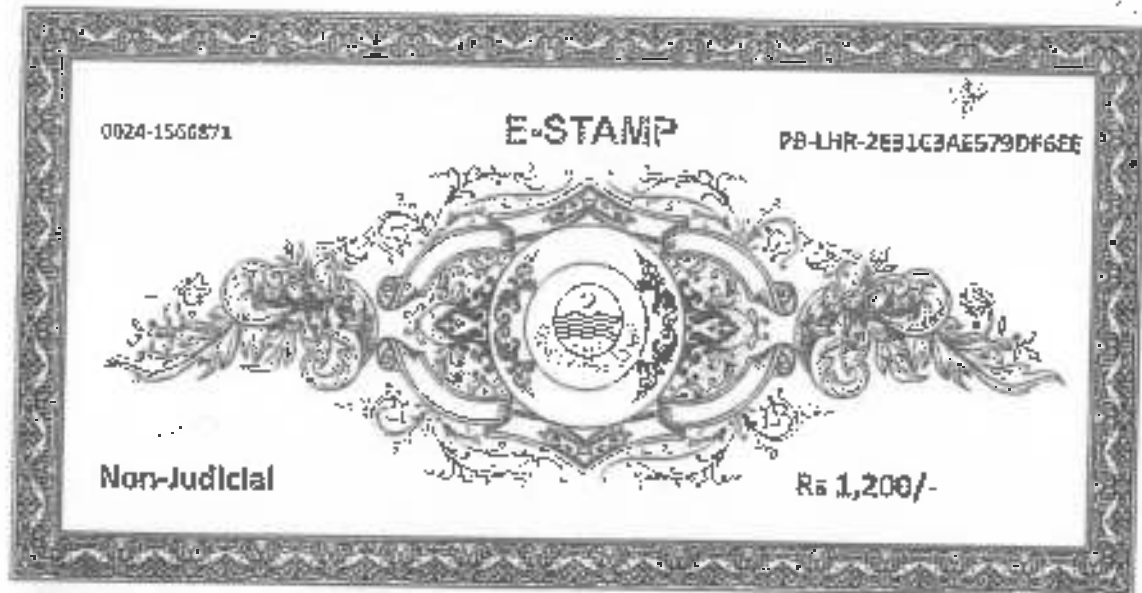
|                   |   |   |   |   |   |   |   |   |   |
|-------------------|---|---|---|---|---|---|---|---|---|
| Intangible Assets | 2 | - | - | - | 2 | 1 | 1 | 0 | 0 |
|-------------------|---|---|---|---|---|---|---|---|---|

|                 |    |
|-----------------|----|
| Opening Balance | 12 |
| Closing Assets  | 18 |
| Depreciation    | 50 |

**SUI NORTHERN GAS PIPELINES LIMITED**  
**PETITION FOR ESTIMATED REVENUE REQUIREMENT**  
**FOR FINANCIAL YEAR 2021-22**

**[10.2] - LPG Air Mix Plants Additions**

| Description                               | Chitral  | Ayun     | Drosh    | Gilgit     | Total      |
|-------------------------------------------|----------|----------|----------|------------|------------|
| LAND FREEHOLD                             |          |          |          |            | -          |
| LAND LEASEHOLD                            |          |          |          |            | -          |
| BUILDING ON FREEHOLD LAND                 |          |          |          | 348        | 348        |
| BUILDING ON LEASEHOLD LAND                |          |          |          |            | -          |
| TRANSMISSION MAINS                        |          |          |          |            | -          |
| DISTRIBUTION MAINS                        |          |          |          | 240        | 240        |
| COMPRESSORS STATION EQUIP                 |          |          |          |            | -          |
| TELECOMMUNICATION EQUIPMENT               |          |          |          |            | -          |
| PLANT AND MACHINERY                       |          |          |          | 309        | 309        |
| MEASURING AND REGULATING (500 Connection) |          |          |          | 10         | 10         |
| TOOLS AND EQUIPMENT                       |          |          |          |            | -          |
| MOTOR VEHICLES                            |          |          |          |            | -          |
| CONSTRUCTION EQUIPMENT                    |          |          |          |            | -          |
| FURNITURE & FIXTURES                      |          |          |          |            | -          |
| OFFICE EQUIPMENTS                         |          |          |          |            | -          |
| COMPUTER HARDWARE                         |          |          |          |            | -          |
| COMPUTER SYSTEM SOFTWARE                  |          |          |          |            | -          |
| SCADA SYSTEMS                             |          |          |          |            | -          |
| <b>TOTAL</b>                              | <b>-</b> | <b>-</b> | <b>-</b> | <b>907</b> | <b>907</b> |



|                                |                                             |
|--------------------------------|---------------------------------------------|
| Description                    | : POWER OF ATTORNEY - 49(b)(a)              |
| First Party / Principal        | : SNEPL [36362-0431766-5]                   |
| Second Party / Attorney Holder | : KAMRAN AKRAM THROUGH GH [38302-2716257-3] |
| Agent                          | : TALAL MUHAMMAD ADV [10000-0000000-0]      |
| Stamp Duty Paid by             | : KAMRAN AKRAM THROUGH GH [35202-2716257-3] |
| Issue Date                     | : 15-Jun-2017, 09:36:40 AM                  |
| Paid Through Chalan            | : 2017523043F38DF                           |
| Amount in Words                | : One Thousand Two Hundred Rupees Only      |

Please Write Below This Line

### GENERAL POWER OF ATTORNEY

By this Deed of Attorney given on 24<sup>th</sup> day of June, 2017, SUI NORTHERN GAS PIPELINES LIMITED, incorporated under the Companies Act, 1913 (now the Companies Ordinance, 1984) and having its registered office at Gas House, 21 Kachhor Road, Lahore (hereinafter called "THE COMPANY") through its Managing Director do hereby appoint Mr. Kamran Akram, General Manager, (Regulatory Affairs) Sui Northern Gas Pipelines Limited (hereinafter called "THE ATTORNEY") its true and lawful Attorney to represent the Company and on behalf of the Company to do or execute all or any of the acts and things hereinafter mentioned that is to say:

1. To represent the Company in all proceedings before the Oil and Gas Regulatory Authority ("OGRA") and / or other regulatory authorities including Director General (Gas), Ministry of Petroleum & Natural Resources, Government of Pakistan.
2. To file and appear in proceedings, sign application, petitions and other documents that may be required to defend the Company petitions(s) for its revenue requirement, tariff, licensing and any other ancillary matters.
3. To sign and file interventions, requests, comments, affidavits, furnish undertakings and / or any other documents that may be required in any matter before OGRA.
4. To appoint Advocates and give them due authority to act and conduct the cases and appear in all proceedings to defend the Company before OGRA and / or any other regulatory authority including Director General (Gas), Ministry of Petroleum & Natural Resources, Government of Pakistan.



Man for execution of the General Power of Attorney due to illness / inability through the Advocate. As the applicant has placed confidence in the Advocate by moving this application through him, the said counsel is appointed as Local Commissioner accordingly. It shall be the duty of said counsel to verify the identity of the Executor from his residence in the locality as well as from NADRA record & he shall be exclusively responsible for any mistake in identity. The said counsel is directed to accordingly get the deed executed in his presence & that of witnesses to the subject property owned by the depositor and no case/stay order is pending before any court of law which he is required to verify from the concerned patwar as well record of this office after the deedful the document be submitted before this office within 4 months. In case of court's order/stay pending and inability in proper identification of deponent the deed be returned without execution. Dated: 15-6-17



Sub-Registrar  
Notary Public for Punjab, Lahore

Presented for registration this General Power of Attorney at Lahore this 29<sup>th</sup> day of June 2017, by Managing Director Sui Northern Gas Pipelines Limited, 21-Kashmir Road, Lahore, before Local Commissioner, Mr. Tahir Mushtaq, Advocate, NBM Law Associates, 220 Dawood Araf Centre, 2<sup>nd</sup> Floor Moj Darya Road, Lahore.



MANAGING DIRECTOR  
CNIC No.

Mr. Tahir Mushtaq  
LOCAL COMMISSIONER  
CNIC No. 35202-2736774-9

DIRECTOR  
CNIC No.

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Execution and contents of this General Power of Attorney have been admitted by the aforesaid executors, who were identified by Mr. Muhammad Ali Chughtai, Senior Law Officer, Law Department, Sui Northern Gas Pipelines Limited, 21-Kashmir Road, Lahore.

MANAGING DIRECTOR  
CNIC NO.

Mr. Tahir Mushtaq  
LOCAL COMMISSIONER  
CNIC NO. 35202-2736774-9

THE ATTORNEY  
CNIC NO. 35202-2716257-3

DIRECTOR  
CNIC NO.

WITNESS  
(Ikram Afzal)  
Exec. Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 21303-5170971-9



WITNESS  
(Muhammad Ali Chughtai)  
Senior Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 35202-5127436-1

WITNESS  
(Muhammad Tahir Rashid)  
Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 35202-2793098-3



E-STAMP  
CONTINUATION SHEET

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All legal acts done by the said attorneys in furtherance of the Company proceedings before OGRA, before execution of this power of Attorney, are hereby ratified and deemed to have been done under lawful authority.

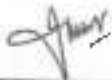
IN WITNESS WHEREOF the common Seal of the Company was hereto affixed on the 29<sup>th</sup> day of JUNE 2017 at Lahore.

The common seal of  
Sui Northern Gas Pipelines Limited  
was hereto affixed in the  
Presence of:

  
MANAGING DIRECTOR  
CNIC No.

  
DIRECTOR  
CNIC No.

WITNESSES:

  
M. Iqbal Afzal  
Executive Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 31303-5170971-9

  
Muhammad Tahir Rashid  
Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 35202-2793098-3

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GM (P&amp;D)

04 JAN 2021

RECEIPT NO.

BGM(P)

04 JAN 2021

RECEIPT NO.



# SLI NORTHERN GAS PIPELINES LIMITED

## MEMORANDUM

|                                      |                                |
|--------------------------------------|--------------------------------|
| From: Company Secretary              | To: General Manager (P&D)      |
| Ref. CA/BOD-1/4623 December 31, 2020 | Thru: DMD (OPS)/SGM (Projects) |

**CONFIDENTIAL**

### ITEM-I

### TECHNICAL CAPACITY BUILDING OF SNGPL HUMAN RESOURCE FOR PARTICIPATION IN NORTH SOUTH GAS PIPELINE PROJECT.

#### (SHORT ORDER)

The Board of Directors considered this agenda item at its 565<sup>th</sup> meeting held on December 31, 2020.

After detailed deliberation, the Board of Directors in line with the recommendation of the Finance and Procurement Committee given at its 315<sup>th</sup> meeting held on December 18, 2020 accorded approval in respect of following subject to fulfillment and completion of all procedural/ codal, legal and financial prerequisites and strictly in accordance with law:

1. Construction of 56" Ø x 260 meters transmission pipeline from AV 31(a) to Punjab Power Plant V/A at a total budgeted cost of Rs. 97 Million (Rupees Ninety Seven Million Rupees Only) by taking budgetary approval from OGRA;
2. The Management was allowed to initiate the procurement process for material immediately due to importance of Project. However, Purchase Orders shall be placed upon receipt of OGRA's approval;
3. In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management was allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project.

The Managing Director was authorized to take or cause to be taken all the necessary steps to give effect to the above decision.

You are requested to please take further action in this regard. The detailed minutes are under preparation and would be communicated after clearance by the Chairperson, Board of Directors.

(IMTIAZ MEHMOOD)  
Company Secretary

cc: MD  
CFO

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**SUI NORTHERN GAS PIPELINES LIMITED**

Note to Directors

From: Managing Director

Note No.7324

Dated: December 24, 2020

**AGENDA FOR THE 565<sup>TH</sup> MEETING OF THE BOARD OF DIRECTOR - ITEM-I**

**TECHNICAL CAPACITY BUILDING OF SNGPL HUMAN RESOURCE FOR PARTICIPATION IN NORTH SOUTH GAS PIPELINE PROJECT**

This item of the agenda was submitted at the 315<sup>th</sup> meeting of the Finance and Procurement Committee of Directors held on December 18, 2020. Recommendations of the F&PC are attached.

  
(IMTIAZ MEHMOOD)  
Company Secretary

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**EXTRACT FROM THE DRAFT MINUTES OF THE 315<sup>TH</sup> FINANCE AND  
PROCUREMENT COMMITTEE OF DIRECTORS HELD ON DECEMBER 18, 2020**

**6. ITEM-F TECHNICAL CAPACITY BUILDING OF SNGPL HUMAN  
RESOURCE FOR PARTICIPATION IN NORTH SOUTH GAS PIPELINE  
PROJECT.**

**6.1 After detailed deliberation, the Finance and Procurement Committee in line with the recommendation of the Management recommended to the Board of Directors to accord approval in respect of:**

1. Construction of 56"Ø x 260 meters transmission pipeline from AV 31(a) to Punjab Power Plant V/A at a total budgeted cost of Rs. 97 Million (Rupees Ninety Seven Million Rupees Only) by taking budgetary approval from OGRA;
2. Company may be allowed to initiate the procurement process for material immediately due to importance of Project. However, Purchase Orders shall be placed upon receipt of OGRA's approval;
3. In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management may be allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project.

# SUI NORTHERNGAS PIPELINES LIMITED

## AGENDA FOR THE FINANCE / PROCUREMENT COMMITTEE MEETING-ITEM NO. F

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### TECHNICAL CAPACITY BUILDING OF SNGPL HUMAN RESOURCE FOR PARTICIPATION IN NORTH SOUTH GAS PIPELINE PROJECT

#### 1-Management Request /Purpose/ Objective:

Government of Pakistan in collaboration with Russian Federation Ministry of Energy has planned to undertake North South Gas Pipeline Project (NSGPP) of about 1100 KM long high pressure transmission pipeline to be laid in minimum 48" or 56" diameter from Karachi to Lahore for the transportation of Re-gasified Liquefied Natural Gas (RLNG) under the auspices of Inter Governmental Agreement (IGA) under Government to Government mode. The design capacity of the pipeline shall be 1.6 BCFD.

Special Assistant to Prime Minister (SAPM) on Petroleum while chairing a fortnightly progress review meeting held on October 13, 2020 stressed the need for participation of both Sui's in executing the project being the local specialist companies engaged in pipeline construction business and urged the both Companies to enhance their technical capacities as HR training so that they can be able to execute such a magnanimous project expeditiously. Moreover, Sui Companies were advised to start a pilot facility to train their HR to build and manage 48" and 56" diameter pipelines and take all necessary actions including training of the staff to complete all formalities in this regard. Minutes of the meeting are enclosed as Annexure- A.

It is also to mention here that Russia-Pakistan technical committee meeting held its first meeting from November 16-18, 2020 in Islamabad on mutual cooperation for the development of gas pipeline project. Energy ministries of both the countries participated in the meeting.

During this meeting NSGPP has been re-named as Pakistan Stream Gas Pipeline Project (PSGPP). Moreover, in response to a question during the recent technical level government to government talks, GOP has proposed to engage both local gas utility companies i.e. SNGPL and SSGCL to be the EPC contractor for ensuring the timely execution of this project. Minutes are enclosed as Annexure-B.

In order to develop in-house technical capacity building of Human Resource and training/knowledge on the equipment/machinery before undertaking PSGPP by SNGPL, we have planned to construct 56" dia x 260 meters high pressure transmission pipeline segment from Valve Assembly AV 31(a), D/S Sidhnai to 24" dia Punjab Power Plant Valve Assembly at MP 261.230(D/S Sidhnai) in the space available in existing Right of Way (ROW). Map showing the location of the proposed segment is attached as Annexure-C.

Although this hookup of existing valve assemblies of transmission network would not have impact on gas flow capacity of the relevant pipeline segment, however stated connection / hook-up of 24" dia Punjab Power line with the rest of the main transmission network will provide operational flexibility during any maintenance and emergency situation by providing a path for gas transfer into/from 24" dia Punjab Power pipeline and vice versa.

#### 2- Financial Information:

Total estimated cost for the construction of this pilot facility shall be Rs. 97 million. Project estimates mainly comprised of steel line pipe price & valves / fittings for hook up/ cross connection between two valve assemblies have been prepared on the prevailing market rates. The project shall be financed through Company's own resources.

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**3- Brief Chronological History:**

A fortnight meeting to review the progress of NSGP in the light of Honorable Supreme Court of Pakistan's Judgment dated 13th October 2020 was chaired by SAPM on Petroleum and was attended by Secretary Petroleum and others, wherein Sui Gas Companies were advised to immediately start pilot facility to train HR staff to build and manage 48" and 56" diameter pipelines. Minutes of the Meeting conveyed vide Ministry of Energy (Petroleum Division) letter ref. No. 6(5)/2016/D-III/NSGP-PS(Vol-VI) dated 23.10.2020 are attached as Annexure-A.

**4- Budget Information / Impact on revenue of the Company:**

The budgeted cost of the pilot facility to be constructed for technical capacity building is Rs. 97 million, details of which are attached as Annexure-D. The related capitalization shall be entitled to rate of return under the existing tariff regime. The project will be undertaken with the approval of OGRA.

**5- Risks Involved/ Mitigation Strategy:**

None

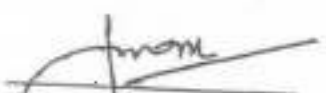
**6- Conformance to Rules/Law:**

It is hereby certified by the management that all procedural, codal, legal, and financial prerequisites shall be fulfilled for completion of the project.

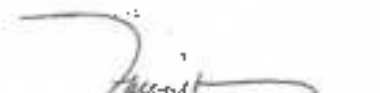
**7- Recommendations:**

It is recommended by the Management to the Finance & Procurement Committee of Directors to recommend to the Board of Directors for approval in respect of:

- 1- Construction of 56"Ø × 260 meters transmission pipeline from AV 21(a) to Punjab Power Plant V/A at a total budgeted cost of Rs. 97 Million (Ninty Seven Million Rupees Only) by taking budgetary approval from OGRA.
- 2- Company may be allowed to initiate the procurement process for material immediately due to importance of Project. However, Purchase Orders shall be placed upon receipt of OGRA's approval;
- 3- In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management may be allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.

  
(Imran Yousaf Khan)  
General Manager (P&D)

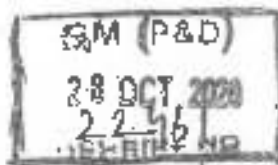
  
(Sibghat Ullah Suri)  
Sr. General Manager (P)

  
(Faizal Iqbal)  
Chief Financial Officer

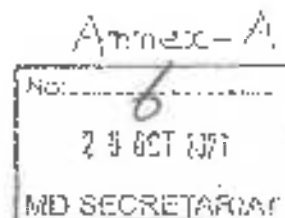
  
(Sohail M. Gulzar)  
Dy. Managing Director (Ops.)

  
(Amer Tufail)  
Managing Director

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P. No. 6(S)/2016/D-III/NSGP-PS(Vol-VI)  
Government of Pakistan  
Ministry of Energy  
(Petroleum Division)



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Islamabad, the 23<sup>rd</sup> October, 2020

Subject: MINUTES OF THE FORTNIGHTLY MEETING ON THE IMPLEMENTATION OF NORTH SOUTH GAS PIPELINE PROJECT (NSGPP) HELD ON 13.10.2020

Please find enclosed minutes of the meeting held on 13<sup>th</sup> October, 2020 on the subject matter, duly approved by the Special Assistant to the Prime Minister on Petroleum, for information and further necessary action.

  
(Umer Saeed Khan)  
Section Officer (Dev-III)

**Distribution:**

- i. Secretary Law and Justice Division.
- ii. Director General (Europe), Ministry of Foreign Affairs, Islamabad.
- iii. The Managing Director, NESPAK, Lahore.
- iv. The Managing Director, Government Holdings (Pvt) Limited.
- v. The Managing Director, Inter State Gas Systems (Pvt) Limited.
- vi. Managing Director, SNGPL, Lahore.
- vii. Managing Director, SSGCL, Karachi.
- viii. Director (Gas), Directorate General of Gas, Policy Wing, Petroleum Division, Islamabad.
- ix. Legal Advisor, Directorate General of Petroleum Concessions, Policy Wing, Petroleum Division, Islamabad.
- x. PS to the Special Assistant to the Prime Minister on Petroleum.
- xi. SO to Secretary, Petroleum Division.
- xii. APS to Additional Secretary (P), Petroleum Division.
- xiii. APS to Joint Secretary I&V, Petroleum Division.

Amr P. S. D.  
  
28/10

cc MD

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MINUTES OF THE FORTNIGHTLY MEETING ON THE IMPLEMENTATION  
OF NORTH SOUTH GAS PIPELINE PROJECT (NSGPP) HELD ON 13.10.2020

A fortnightly meeting to review the progress on the North South Gas Pipeline Project in light of the Hon'ble Supreme Court of Pakistan's judgement dated 13<sup>th</sup> August 2020 was chaired by Special Assistant to Prime Minister (SAPM) on Petroleum and was attended by Secretary Petroleum amongst others. The list of participants is attached as Annex-A.

2. The following presentations were given to the participants:
- ISGS Presentation on the implementation status of decisions taken in 25<sup>th</sup> September 2020 and 7<sup>th</sup> September 2020 meetings (Annex-II);
  - SNGPL presentation on the North South Gas Pipeline (800 km) laying options; equipment requirement, and training (Annex-III); and
  - NESPAK presentation on the draft Technical Proposal regarding consultancy services for North South Gas Pipeline Project covering feasibility study, route finalization, land data for acquisition of land, and Social and Environmental Impact Assessment (Annex-IV).

3. After deliberations, the following decisions were taken in the meeting:

Pipeline diameter:

- Based on the in-house studies and meeting held on 5<sup>th</sup> October 2020 with Sui's, 56" is the most optimal pipeline dia however the Sui Companies have no experience and no equipment to lay such pipe. SAPM suggested to take a firm decision in this regard after discussion with the Russian Ministry of Energy as part of technical level talks and that the specs of course would cater to Pakistan's current and future gas needs. Sui Company's participation in the NSGP is of prime importance as it will provide them a novel opportunity to develop demonstrable capability including technical knowhow, availability of relevant equipment/machinery, and trained human resource to build and manage 48" and 56" diameter pipelines. Sui companies were advised to immediately start a pilot facility to train their HR on take all necessary actions including training of the staff to complete all formalities in this regard.
- Pre FEED Consultancy Work:
- NESPAK's draft Technical proposal on the proposed Scope of Work covering: (i) route finalization; (ii) collection of land data for land acquisition; (iii) SEIA; and (iv) project feasibility study, was approved with the amendment that the feasibility study will be undertaken by NESPAK independently. Arrangement of resources for the Feasibility Study and SEIA will be the responsibility of NESPAK. It was advised that NESPAK should ensure

maximum use of consultancy payment with PKR and make maximum effort to minimize use of Forex for consultancy services. Regarding the engagement of NESPAK the proposal to seek PPRA exemption was considered. SAPM explained that similar issues have been discussed in the Cabinet meeting several times, where the Finance Division has given clear view that such issues need to be handled at the procuring agency level, being the competent authority under the relevant PPRA rules, to declare emergency and engage the appropriate service provider. Accordingly, ISGS should seek the approval and MOE-PD will issue necessary advice to ISGS in this regard and also offer its support.

- iii. In order to expedite the consultancy work to meet the time line given by Hon'ble Supreme Court of Pakistan, NESPAK will start the consultancy work including field survey and collection of land acquisition data Southwards from Lahore and Northwards from Pakland, Karachi simultaneously. NESPAK will provide first parcel of land data (from Head Balloki to Depal Pur - 85 km) to ISGS for verification by January 2021. NESPAK will complete all deliverables as per the Scope of Work within the proposed 12-15 months' time.
- iv. NESPAK will coordinate with Suis to select the Pipeline ROW in a way that it is near to the existing transmission network. The offtake points will also be finalized based on the network and demand requirements of Suis as NSGP is being planned and built as an open access pipeline with Underground Storages and Compressions facilities where needed.

**Aligning Pipeline Capacity and LNG Terminal development plans:**

- v. SAPM informed that the PM chaired a meeting with LNG developers recently, where they requested the availability of pipeline capacity for their upcoming LNG terminals on priority. A follow up meeting was held in Petroleum Division on 7<sup>th</sup> October 2020 where it was decided that MoE-PD will request this information from the LNG terminal operators' in writing. Further to which Petroleum Division has asked LNG terminal operators to convey in writing LNG terminals commissioning dates; gas volumes to be transported through the pipeline, entry and exit points, etc. Upon receipt of the information, MOE-PD will provisionally allocate the pipeline capacity.
- vi. SSGCL will assess the route of pipeline from Port Qasim to Pakland whether ROW for another pipeline can be obtained. The initial response is that an additional line can be built, but apparently there is a railway crossing issue at one point. SSGCL to present their proposal at next fortnightly meeting on ways and means to a solution.

**Land Acquisition:**

- vii. To strengthen ISGS Land department, it was decided that Suis will depute some of their land personnel with ISGS on secondment basis. ISGS will

continue hiring its own staff to strengthen its land department on permanent basis.

- viii. Based on ISGS funding requirement for the Project including land cost, it was decided to closely work with the Finance Division for release of funds at the earliest and opening of assignment account.
- ix. Secretary Petroleum advised to compensate the land owners on market rates to avoid litigation and ensure timely completion of the Project.
- x. Considering the ROW width is 42 meters to lay two pipelines; to avoid land rights issues at the time of laying the second pipeline, it would be appropriate that ISGS owns the project land; and provides land leasehold rights to SPV. For the accounting treatment of the second pipeline, SAPM advised to capitalize one pipeline ROW width (37m) and the rest to be kept as an asset of the Petroleum Division on ISGS accounting books.

**GIDC Collection and Review Petitions:**

- xi. The status of GIDC amount billed and collected by Suis was noted. SAPM advised Suis to provide necessary details to MOE-PD about the amount which could not be recovered due to stay orders issued by different courts, and the amount which was not paid by the life line customers due to financial crunch and likewise by industry due to Covid-19.
- xii. Mr. Abdul Rashid Jokhio, Director (Gas) informed that review petitions have been filed in the Supreme Court of Pakistan which are admitted as well, so implementation status/ report might be required at any time. SAPM advised to maintain a record on the development of North South Gas pipeline as implementation status of the decision of the Hon'ble Supreme Court. MD ISGS apprised that a focal person (Document Controller) in ISGS has been nominated to collect & maintain all relevant record in a chronological order.

**FORTNIGHTLY MEETING ON THE IMPLEMENTATION OF NSGP PROJECT  
HELD ON 13<sup>th</sup> OCTOBER, 2020 - ISLAMABAD**

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**LIST OF PARTICIPANTS**

| Designation / Organization |                         |                                                   |
|----------------------------|-------------------------|---------------------------------------------------|
| 1.                         | Mr. Nadeem Babar        | Special Assistant to PM on Petroleum              |
| 2.                         | Mian Asad Hayat D/o     | Secretary, Petroleum Division                     |
| 3.                         | Ms. Saifra Najeeb Ahmed | JS (I & JV) Petroleum Div. / MD - ISGSL           |
| 4.                         | Ms. Ayesha Saeed        | Director (Europe-II), Ministry of Foreign Affairs |
| 5.                         | Mr. Hassan Mehmood      | Dy. Legislative Advisor, Ministry Law & Justice   |
| 6.                         | Mr. Niaz Muhammad       | Deputy Secretary - Petroleum Division             |
| 7.                         | Mr. Rasheed Jokhio      | Director (Tech.), Directorate General (Gas)       |
| 8.                         | Mr. Umar Saeed Khan     | Section Officer (D-III), Petroleum Division       |
| 9.                         | Ms. Shaista Gul         | Assistant Chief, PD & Special Initiatives         |
| 10.                        | Mr. Masood Nabi         | Managing Director, GHPL                           |
| 11.                        | Mr. Muhammad Waseem     | DMD (Operation), SSGCL                            |
| 12.                        | Mr. Ghulam Moin Butt    | GM (Eng. Services), SSGCL                         |
| 13.                        | Mr. Sibghat Ullah       | Sr. GM (P), SNGPL                                 |
| 14.                        | Mr. Imran Yousof        | GM (Production & Development), SNGPL              |
| 15.                        | Mr. Yawer Ansari        | General Manager, NESPAK                           |
| 16.                        | Mr. Zargham Ishaq Khan  | GM (Building Services / IT), NESPAK               |
| 17.                        | Mr. Farooq Qamar        | AGM Technical, ISGSL                              |
| 18.                        | Mr. Ijaz ul Haq         | Act. Chief Financial Officer, ISGSL               |
| 19.                        | Mr. Aurangzeb Mehmood   | Chief Manager (Legal), ISGSL                      |
| 20.                        | Mr. Athar Mehmood Shah  | Chief Manager (Procurement), ISGSL                |
| 21.                        | Mr. Yasir Manzoor       | Chief Manager (Land Acquisition), ISGSL           |
| 22.                        | Mr. Asif Hussain        | Dy. Chief Engineer, ISGSL                         |
| 23.                        | Mr. Mudassar Hussain    | Company Secretary, ISGSL                          |

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E.No. 6(5)/2016/D-III/NSGP-PS (Vol-VI)

Government of Pakistan  
Ministry of Energy  
(Petroleum Division)  
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QM (P&amp;D)

25 NOV 2020

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MD -

Annex-B

Islamabad, the 23<sup>rd</sup> November 2020

Subject: MINUTES OF THE MEETINGS OF THE TECHNICAL COMMITTEES OF GOVERNMENT OF PAKISTAN AND THE RUSSIAN FEDERATION FOR THE NORTH SOUTH GAS PIPELINE PROJECT (NSGPP).

Please find enclosed approved minutes of the meetings held between the technical committees of the Russian Federation and the Government of Pakistan from 16<sup>th</sup> to 18<sup>th</sup> November 2020 for information.

QM (P&amp;D)

22  
27/11

(Umer Saeed Khan)  
Section Officer (D-III)  
051-9204206

Distribution:

- i. Secretary, Finance Division.
- ii. Secretary Law and Justice Division.
- iii. Director General (Europe), Ministry of Foreign Affairs.
- iv. The Managing Director, NESPAK, Lahore.
- v. The Managing Director, Government Holdings (Pvt) Limited.
- vi. The Managing Director, Inter State Gas Systems (Pvt) Limited.
- vii. Managing Directors, SNGPL and SSGCL.
- viii. Director (Gas), Directorate General of Gas, Policy Wing, Petroleum Division, Islamabad.
- ix. Legal Advisor, Directorate General of Petroleum Concessions, Policy Wing, Petroleum Division, Islamabad.
- x. PS to the Special Assistant to the Prime Minister on Petroleum.
- xi. SO to Secretary, Petroleum Division.
- xii. APS to Additional Secretary (P), Petroleum Division
- xiii. APS to Joint Secretary I&IV, Petroleum Division

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MINUTES OF THE FIRST JOINT RUSSIA-PAKISTAN TECHNICAL  
COMMITTEE MEETING FOR THE IMPLEMENTATION OF THE NORTH-  
SOUTH GAS PIPELINE PROJECT

1. The first meeting of the Joint Russia-Pakistan Technical Committee for the implementation of the North-South Gas Pipeline Project (hereinafter – the JTC) was held on November 16-18, 2020 in Islamabad, Pakistan.
2. The Russian Side of the JTC was headed by the Deputy Director of International Cooperation Department of the Ministry of Energy of the Russian Federation Mr. Vasily B. Ereminenko and included representatives from the Ministry of Energy of the Russian Federation, Embassy of Russia in Pakistan, Trade Representation of Russia in Pakistan, the Federal State Unitary Enterprise (FSUE) "Centre of Operations Services" of the Ministry of Energy of the Russian Federation, as well as "Eurasian Pipeline Consortium" Ltd. and PAO «TMK».
3. The Pakistani Side was headed by the Secretary, Petroleum Division, of the Ministry of Energy of the Islamic Republic of Pakistan, Mian Asad Hayat Din and representatives of the Technical Committee of NSGP as well as the Special Assistant to the Prime Minister on Petroleum, Mr. Nadeem Babar.
4. The full list of the meeting attendees is enclosed as Annex I.
5. During the course of the meetings, both Sides reiterated and underscored the strategic importance of the Project in strengthening and establishing long-term bilateral relationship between the two Governments, based on mutual strategic interests beyond commercial considerations. Pakistani side also stressed upon the importance of the Project vis-a-vis its energy requirements and involvement of the Russian Federation in the implementation of the Project for bolstering the bilateral relationship.
6. The Pakistani side provided the Russian side with the answers on the technical, commercial and legal questions raised in the letter of the Minister of Energy of the Russian Federation H.E. Alexander Novak dated 23 October 2020 (Annex II).
7. The Russian side shall study the provided answers and shall get back with its feedback and additional comments/queries not later than 30 November 2020.
8. Both sides discussed and proposed necessary amendments to the Agreement between the Government of the Russian Federation and the Government of the Islamic Republic of Pakistan on cooperation for the development of the North-South Gas Pipeline Project of 16 October 2015 (hereinafter – IGA), subject to the approval of the Ministry of Energy of the Russian Federation, higher management as well as the respective government authorities of the Russian Federation and Ministry of Energy (Petroleum Division) of the Islamic Republic of Pakistan and relevant approvals from competent fora (Annex III). Both

sides will make best efforts to execute the Protocol of the amendment to IGA by 7<sup>th</sup> JCC meeting.

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9. In the wake of the judgment of the Hon'ble Supreme Court of Pakistan in the matter of Gas Infrastructure Development Cess (GIDC) the JTC proposed a revised project structure which was reflected in the draft of Protocol of the amendments to IGA. As per the revised project structure, the Pakistani side provided the Russian side with the draft of the Shareholders Agreement, which will be reviewed by the Russian side (Annex IV).

10. The JTC recommended to contribute seed money in proportion to the respective shareholding of each party upon incorporation of the SPC.

11. The Pakistani side explained that the growing demand and supply of gas in the country has necessitated revision of the Project technical parameters that includes enhancing the transportation capacity of the pipeline from 1.2 to 1.6 Bcfd, with optional pipeline diameter of 48" at least. The exact technical and economic parameters of the Project shall be specified in the relevant reports and studies reflecting current and prospective gas demand and supply in Pakistan.

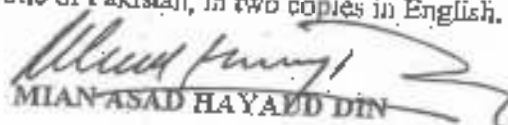
12. As per the recommendation of the JTC, both sides shall discuss and agree upon the future Shareholders Agreement not later than 31 December 2020.

13. Both sides also discussed other opportunities of mutual beneficial cooperation including the LNG supplies by the Russian companies, as well as the possibility of the construction of Underground Gas Storages (UGS) in Pakistan, onshore LNG terminals and other related infrastructure projects.

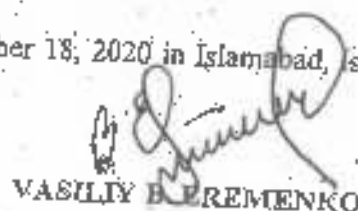
14. The JTC agreed to convene bi-monthly virtual meetings of the Technical Committee and discussions in order to follow-up on the implementation of the project, as well as to finalize the proposed draft of the Shareholders Agreement, Memorandum and Articles of Association of proposed Special Purpose Company (SPC), agreement etc.

15. The JTC recommended to hold the 7<sup>th</sup> meeting of the Russia-Pakistan JCC in second half of January 2021 in Moscow, the Russian Federation.

The minutes of the meeting are signed on November 18, 2020 in Islamabad, Islamic Republic of Pakistan, in two copies in English.

  
MIAN ASAD HAYAED DIN

Secretary of the Ministry of Energy,  
Petroleum Division of Pakistan

  
VASILY BEREMENKO

Deputy Director of International Cooperation  
Department of the Ministry of Energy of the  
Russian Federation

**LIST OF QUESTIONS FOR THE PAKISTAN SIDE REGARDING PARAMETERS OF  
IMPLEMENTATION OF CONSTRUCTION PROJECT << NORTH-SOUTH >> GAS  
PIPELINE**

**Financial questions:**

| S. # | Question                                                                                                                                                                                                        | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | How will the financial model of the joint venture that is being created be developed?                                                                                                                           | Pakistan and Russian nominated entities will contribute the funds in a JV Company/Special Purpose Vehicle (SPV) to be formed as a Company in Pakistan under Pakistani Laws with majority shareholding with Pakistani Nominated Entity (PNE). The funding from PNE will be in the form of equity.                                                                                                                                                                                                                                                                 |
| 2.   | How will the total project cost be approved (including FEED stages, engineering, purchasing, construction and entry into operation of the pipeline) and how will this cost be allocated across main cost items? | FEED will be conducted by JV Company formed under the Pakistan law and cost figures will be firm up with the approval of Board of Directors of the JV Company. The total project cost above fixed ROE shall be lowest possible cost, arrived at after deliberations by Pakistani side.                                                                                                                                                                                                                                                                           |
| 3.   | How will the Russian participant be guaranteed the return of investment on stages prior to the completion of construction phase of the project?                                                                 | <ul style="list-style-type: none"> <li>• <i>Currency of investment</i> as equity will be Pak Rupees.</li> <li>• <i>At what stage:</i> Initially the seed money at the time of incorporation of SPV and later as per the shareholding agreement/ financing plan;</li> <li>• <i>Period:</i> Investment will be done as equity injection by PNE. The arrangement at the maturity/end of project life shall be mutually agreed between JV Company participants; and</li> <li>• <i>Conditions:</i> Will be mutually decided with Russian Nominated Entity.</li> </ul> |
| 4.   | How will the Russian participant be guaranteed the return of investment on stages prior to the completion of construction phase of the project?                                                                 | The Project returns shall accrue upon commencement of commercial operations of the project. Any terms in this respect may be negotiated between the JV Company participants mutually.                                                                                                                                                                                                                                                                                                                                                                            |
| 5.   | What guarantees of investment protection of the Russian JV participant (beyond the usual sovereign guarantee) may be offered by the Pakistan side?                                                              | Russian Nominated Entity may be given the first and preferred right to dividend / return confirmed via upfront approved tariff assuring a specific ROE.                                                                                                                                                                                                                                                                                                                                                                                                          |
| 6.   | How will return of investment be effected. — via purchase of shares or via a tariff?                                                                                                                            | During the period of project, ROE will be part of tariff. Call/put option at the project maturity may be deliberated between nominated entities.                                                                                                                                                                                                                                                                                                                                                                                                                 |

| S. # | Question                                                                                                                                                                                   | Response                                                           |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 7.   | Is the Pakistan side ready to finance the project with part of project financing being organized by the joint venture (to minimize the risks of the Russian side's capital participation)? | Pakistan side is committed to equity-finance its share of Project. |

## Legal questions:

| S. # | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Are the changes proposed by the Pakistan side to the previously approved in the Intergovernmental agreement and the protocol of the 6 <sup>th</sup> session of the coordination committee) project structure (including BOOT-agreement, commercial agreement, sovereign guarantee) caused exclusively by the need to comply with the decision of the supreme court of Islamic Republic of Pakistan to use the gas infrastructure tax? What the main points of this decision and what is the timeline to comply with them? | <p>Yes, the changes in the intergovernmental agreement caused by the judgement of the Supreme Court of Pakistan.</p> <p>The main point of the decision of the Supreme Court is direction to the Government of Pakistan to take all steps to commence work on the laying of the North-South pipeline within six months. Ministry of Energy is foreseeing the execution of Shareholders Agreement; incorporation of SPV; signing of amended Inter-Governmental Agreement; and initiation of land acquisition activities, etc. till Feb. 2021.</p> |
| 2.   | What basic terms of the Shareholders agreement between JV Participants are envisioned by the Pakistan side? Which applicable laws?                                                                                                                                                                                                                                                                                                                                                                                        | The Shareholders Agreement is under preparation, and its broad contours will be discussed in the upcoming meeting on 16 <sup>th</sup> November 2020.                                                                                                                                                                                                                                                                                                                                                                                            |
| 3.   | JV participants (as specified by the changes to the Intergovernmental agreement) are to prepare an EPC agreement within 6 months. What is meant here—the agreement between the JV and the future EPC contractor (with whom the contract for engineering, supply and construction shall be concluded).                                                                                                                                                                                                                     | In order to expedite working on the Project, Pakistan side proposes to engage local gas utility companies (SNGPL and SSCC) to be the EPC contractors to ensure timely execution of the Project.                                                                                                                                                                                                                                                                                                                                                 |
| 4.   | What agreements shall be foreseen by the new version of the Intergovernmental agreement? Is it mandatory to sign the agreement                                                                                                                                                                                                                                                                                                                                                                                            | Pakistan side does not see any need of signing the Facilitation agreement by Ministry of Energy (Petroleum Division). The Project will be implemented under the auspices of IGA under Government to                                                                                                                                                                                                                                                                                                                                             |

| S. # | Question                                                                                 | Response                                                                                                                                                                                                              |
|------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | regarding support of the Project by the Government of Pakistan (Facilitation agreement). | Government mode and therefore will be supported by Ministry of Energy (Petroleum Division) and it is expected that it will be supported by Ministry of Energy of Russian Federation as Government Counterpart entity. |

#### Technical questions:

| S. # | Question                                                                                                                                                                                                                                                                                              | Response                                                                                                                                                                                                                                                       |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | What is the designed capacity of the pipeline (11 or 16 billion cubic meters per annum)?                                                                                                                                                                                                              | The design capacity of the pipeline shall be 1.6 bcf/d (16.54 bcm per annum).                                                                                                                                                                                  |
| 2.   | What resource base shall be supplying the gas pipeline and what are the guarantees of its readiness at the time that the gas pipeline begins operation?                                                                                                                                               | Gas source/supply is foreseen from the expansion of capacities of two existing LNG terminals and two new LNG terminals. The terminal operators have shown their readiness by 2023. The completion of NSGP pipeline and new LNG terminals will be synchronized. |
| 3.   | What work items - in the view of Pakistan side - shall be performed by local contractors / suppliers and what share (estimate) may they occupy in the total Project cost?                                                                                                                             | The local contractors shall carry out construction activities, and labour and material locally available will be utilized. The equipment and material to be imported can be done by Russian Nominated Entity (RNE).                                            |
| 4.   | Why was the timing of the Project realization reduced in such a dramatic fashion (from 25 years to 5 years) - is it due to the fact that only the construction and entry into operation are accounted for and not the operation period? Or have there been substantial changes to the project design? | The term of the Project will be [25] years.                                                                                                                                                                                                                    |
| 5.   | On what basis will the resources and responsibilities be allocated among JV participants with regards to implementation of the main stages of the project: FEED, engineering, purchasing, construction and entry into operation? What will the Russian JV participant be responsible for?             | The material locally available shall be arranged by Pakistan side while the equipment/ material to be imported can be on the part of Russian side. The FEED, construction and operational activities will be carried out by the JV Company/SPV jointly.        |

| 8. # | Question                                                                                                                                                                                  | Response                                                                                                                                                     |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6.   | Who will own the gas pipeline after its entry into operation and for how many years (or until which event)?                                                                               | The pipeline will be owned and operated by JV Company/SPV for the project term (25 years).                                                                   |
| 7.   | With which party will the owner of the gas pipeline conclude the gas transportation agreement and on what basic terms (guarantees, payment terms, expected tariffs, applicable law etc.)? | JV Company/SPV will execute gas transportation agreements with LNG terminal operators, other shippers on commercial terms under the regulatory requirements. |

**PROTOCOL**  
**on the amendments to the Agreement between the Government of the Russian Federation and the Government of the Islamic Republic of Pakistan on cooperation for the development of the North-South Gas Pipeline Project** 138  
**of 16 October 2015**

The Government of the Russian Federation and the Government of the Islamic Republic of Pakistan, hereinafter referred to as the Parties,

in accordance with Article 6 of the Agreement between the Government of the Russian Federation and the Government of the Islamic Republic of Pakistan on cooperation for the development of the North-South Gas Pipeline Project of 16 October 2015 (hereinafter – the Agreement),

have agreed as follows:

**Article 1**

To amend the Agreement as follows:

a) in title of the Agreement the words "of the North-South Gas Pipeline Project" substitute by the words "Pakistan Stream Gas Pipeline (PSGP) Project";

b) in Article 1:

the words "of the North-South Gas Pipeline Project" substitute by the words "Pakistan Stream Gas Pipeline (PSGP) Project";

the words "the city Lahore" substitute by the words "Phool Nagar, District Kasur, Punjab";

c) in Article 2:

in paragraph two of point 1 the words "the Ministry for Petroleum and Natural Recourses of the Islamic Republic of Pakistan" substitute by the words "the Ministry of Energy (Petroleum Division) of the Islamic Republic of Pakistan";

in paragraph two of point 2 the words "limited liability company "RT-Global Resources" and its affiliates" substitute by the words "nominated by competent authority of the Russian Side a joint venture of Federal State Unitary Enterprise "Operations Services Centre" of the Ministry of Energy of the Russian Federation", "Eurasian Pipe-Line Consortium, Ltd." and "PAO TMK" and/or their wholly owned subsidiaries";

d) points 2, 3 and 4 of Article 3 are deleted.

e) supplement the Article 3 with paragraph 5 as follows:

"The Parties have agreed that their Nominated Entities shall incorporate a special purpose company (SPC) in the Islamic Republic of Pakistan for the implementation of the Project, wherein the Pakistan Nominated Entity shall have majority shareholding.

The Russian Nominated Entity shall have not less than 26% shares in the SPC to be paid up by the Russian Nominated Entity by way of cash or in-kind contribution of the services and products to be used in the Project, as decided by the Russian Nominated Entity, subject to compliance of State Bank of Pakistan regulations.

Recognizing the expertise of the Russian Nominated Party in construction of similar projects, during the construction phase of the Project, the Russian Nominated Entity shall consult with the Pakistan Nominated Entity following which, the Russian Nominated Entity shall have the right to decide on matters related to the design, engineering, procurement and construction of the Project, in a transparent manner according to international quality standards, cost competitiveness (benchmarking pipe and equipment with Russian Federation and all the field work benchmarking with Pakistan) and compliance with international standards. For all other matters during the term of the Project all decisions shall be made by the majority except for "reserved matters" to be agreed upon in the shareholders agreement.

The SPC shall ensure maximum utilization of Pakistan and Russian materials and resources based on the principles of transparency, cost competitiveness and compliance with applicable international standards.

All procurement of goods, services and works by the SPC in pursuance of this Agreement shall be exempted from the public procurement laws of Pakistan.

The Pakistani Party shall (a) guarantee the investment required for the Pakistan Nominated Entity during the construction, (b) guarantee compensation to Russian Nominated Entity as agreed upon in the shareholders agreement, (c) ensure performance obligations of the Pakistan Nominated Entity during the implementation of the Project, and (d) give priority of dividend distribution to the Russian Nominated Entity from cash flows available in SPC. The Russian Party shall ensure performance obligations of the



Russian Nominated Entity during the implementation of the Project.

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The Pakistani Party shall enter into an agreement with the SPC and the Russian Nominated Entity, which shall incorporate concessions, incentives, exemptions including taxation, foreign exchange protections, and any other benefits available to the Russian Nominated Entity for this project, which shall be no less favorable than afforded to any other investment on a Government to Government basis. Any project agreements shall be concluded by the SPC with the relevant counter parties.

The Pakistani Party shall ensure all concessions, approvals, autorisations and exemptions for the Project to enable joint ownership of the Project by the Pakistani Nominated Entity and Russian Nominated Entity at the development, construction and operation stages.

#### Article 2

The present Protocol shall enter into force on the date of signing by the Parties.

Done at \_\_\_\_\_ on \_\_\_\_\_ 2020, in duplicate in the Russian and English languages, both texts being equally authentic.

For the Government  
of the Russian Federation

For the Government  
of the Islamic Republic of Pakistan



Annex - D  
1.82



### Budgeted Cost

Laying of 56" Dia 260 Mtr. 0.688" W.T. Transmission Line

(Sidhnai D/S AV31a - V/A Punjab Power Plant)

(Million Rupees)

| <u>Description</u> |                     | <u>Total</u>  |
|--------------------|---------------------|---------------|
| 1                  | <u>Material</u>     |               |
|                    | Line pipe           | 34.220        |
|                    | Coating Cost        | 2.663         |
|                    | Hook-Up with V/A's  | 40.000        |
|                    | Joint Coating       | 0.455         |
|                    | Cathodic Protection | -             |
|                    | Transportation      | 0.734         |
|                    | (a)                 | 78.072        |
| 2                  | Construction Cost   | 6.000         |
| 3                  | Crop Compensation   | 0.117         |
| 4                  | Freehold Land       | -             |
| 5                  | Civil Works         | 2.000         |
| 6                  | HSE                 | 0.200         |
| 7                  | Survey & Design     | 5.140         |
| 8                  | Security            | 0.190         |
| 9                  | Quality Assurance   | 2.000         |
| 10                 | Camp set up         | 1.000         |
| 11                 | Overheads           | 2.662         |
|                    | (b)                 | 14.309        |
|                    | (a+b)               | 92.381        |
| 12                 | Contingencies (5 %) | 4.619         |
|                    | (c)                 |               |
|                    | (a+b+c)             | 97.000        |
| <u>Grand Total</u> |                     | <u>97.000</u> |

# SUI NORTHERN GAS PIPELINES LIMITED

## MEMORANDUM

From: Sr. General Manager (C)

To: General Manager (RA)

Ref: P&D/02-14671

Date: 05.01.2021

Your Ref:

Dated:



### GIS MAPPING PROJECT OF GAS INFRASTRUCTURE

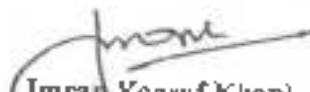
Geographic Information System (GIS) is a revolutionary technology that is being globally implemented for critical decision making, planning/monitoring and asset management particularly in the Public sector organizations. GIS is the science of location combined with the analytical powers of computer technology, which enables its users to analyze any location-related issue ranging from simple feasibility study to complex planning jobs. The SNGPL's pipeline network is the largest pipeline system of Pakistan sprawling over very large franchise area that was in dire need of an efficient solution like GIS for managing, monitoring, planning and decision making of such a complex network.

As per the Board of Director's (BoD) directive and Ministry of Energy's advice to implement a full-fledged GIS for SNGPL's distribution pipeline network in shortest possible time frame, a comprehensive plan was prepared to delineate the infrastructure and human resource requirements along with the cost estimates and timelines.

Accordingly, the GIS project completion plan has been approved by BoD in its 565<sup>th</sup> meeting held on 31-12-2020. Detailed agenda for the infrastructure, human resource and other requirements for timely completion of GIS mapping project which was put up to Board of Directors along with Board's approval is enclosed herewith.

Please take up the case with OGRA accordingly.

Please take up the case with OGRA accordingly.

  
Imran Yousaf Khan  
Sr. General Manager (C)

Encl: As above

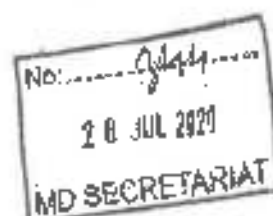
Cc: CFO  
Cc: GM(P&D)  
Cc: GM(F)

| RA Department |                       |
|---------------|-----------------------|
| Date 7/1      |                       |
| CO(RA)        | Action Required:      |
| SE(RA)        | Please do the needful |
| EOLA          | Please discuss        |
| EO(RA)        | For r/o Please        |
| EE(RA)        | File                  |
| O(RA)         |                       |

make it part of ERP 21-22

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Government of Pakistan  
Ministry of Energy  
Petroleum Division



To;

**Managing Director**  
**Sui Northern Gas Pipeline Limited (SNGPL)**  
**Lahore**

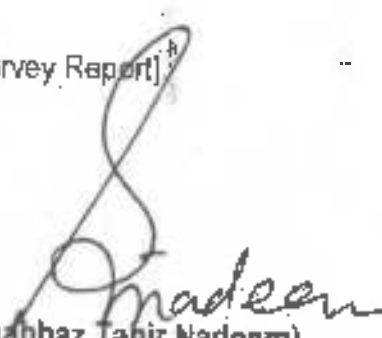
Islamabad, 21<sup>st</sup> July, 2020

**Subject: Geographic Information System**

With reference to the visit of Mr. Khushnaam Ali (Assistant Director) to SSGC headquarter regarding "Geographic Information System" installed in SSGC headquarter Karachi. After submission of post visit report it is advised by the competent authority to replicate the same in SNGPL.

2. Sui companies can solve multiple issues depending on the requirements/issues being faced by them. Studies/simulations can also be carried out to proper address issues pertaining to counter UFG, Pressure maintenance, proper laying down of network, right directions of pipelines, SMS, TBS, valve (Entry/exit Points), Gas health, knowing the topography i.e. knowledge of railway tracks, water flows, land diagrams and many more. SNGPL is requested to provide information about the following points:

1. Present working on GIS system.
2. Transmission and distribution report on GIS [Complete Survey Report]
3. Time require to complete and fully implement the GIS.

  
(Shahbaz Tahir Nadeem)  
Deputy Secretary

TIME LINE CASE  
By Email/Courier

Government of Pakistan  
Ministry of Energy  
(Petroleum Division)

SUBJECT: TASKS FOR INCLUSION IN PERFORMANCE AGREEMENT

I am directed to refer to the meeting held on the subject at Prime Minister's Office on 2<sup>nd</sup> June, 2020 and to say that during the meeting Prime Minister's Office has shared the attached proforma. It is therefore, requested that the requisite information under the light of tasks pertaining to your office/department, may please be shared with the undersigned according to enclosed template on top priority basis, for onward submission to authority concerned.

3. Soft copy of the solicited information be provided at ednuppr@gmail.com that enabling us to prepare a consolidated response.

Encls: As above

*provide inputs on items pertaining to your section at earliest*  
*DD (PSP) / AO*  
*3/6/2020*

(SHAHBAZ KHAN)  
Section Officer (CDN)  
Tel. 9209930

1. Joint Secretary (IAJV), M/o Energy, Petroleum Division.
2. Executive Director General, Policy Wing, Petroleum Division.
3. Director General (Oil/Gas/PC/LG/SP/Minerals/PDIP), Petroleum Division.
4. Director General (GSP), Quetta.
5. Deputy Director (Admin), Policy Wing, Petroleum Division.
6. Deputy Secretary (CA), Petroleum Division.
7. Section Officer (Admin), Petroleum Division.

CDN Section's U.O No. 4(2)/2019-CDN-Min-Matter, dated. 11.05.2020

*URGENT*  
*pick up response on relevant items*  
*DD (HOS)*  
*Mr. Imran Sultan*  
*9/6/20*

①

### Tasks Assigned Petroleum Division

#### 1. Policy

- i. Apply regulatory Civil Code to simplify rules, regulations, policies and reduce or eliminate redundant regulations.
- ii. New exploration policy and strategy with targets to encourage domestic exploration, refining, development and production of petroleum products and gas.
- iii. New policy on energy conservation.
- iv. Integrated policy for development/reform of gas sector covering supply, transmission and distribution.
- v. Framework of cooperation between federal and provincial governments for development of petroleum, natural resources and mining.

#### 2. Tasks

- i. Energy security strategy
- ii. Demand/Supply assessment and projections (Petroleum, oil, Gas) for next 15 years along with plans to bridge the gaps. (BC)
- iii. Oil refinery (at Qwadar) project's plans and implementation schedule
- iv. Targets and plan for award of new concession licenses for oil and gas exploration over next 3 years
- v. Plans with timelines for establishment of LNG terminal, atleast 2 new terminals by 2021.
- vi. Progress on projects/plans of the CPET Working Group of Petroleum
- vii. Develop a plan with specific targets and timelines. (UEG)
- viii. Strategy and plan to reduce cost of petroleum products and gas with specific tasks and timelines.
- ix. Strategy and plans to minimize procurement of foreign supplies to ensure predictable and lower cost.
- x. Development of cost and operational efficiency targets alongwith KPIs for SNGPL and regular reporting. (COA)
- xi. Implementation plan with timelines for completion of North-South gas Pipeline project with Russia.
- xii. Complete all ongoing projects by ISGS, SNGPL, SSCC etc. (Implementation plan may also be shared). (PFI)
- xiii. Commissioning of PARCO Oil Refinery by 2023
- xiv. Other projects to be completed in the medium to long term e.g. Offshore Gas Project, TAPI and others. (PFI)
- xv. Implementation of planned Saudi investment in oil refinery (implementation plan may also be shared).

#### 3. PSDP Plus

- i. Concession for oil and Gas Prospecting Rights
- ii. Mineral Prospecting Rights

#### 4. Administrative/miscellaneous

- i. Review of vacant positions of Head of Attached Departments/ Organizations. (HR)
- ii. Improve the website with all requirements concerning functions, procedures, SOPs etc. under the Ministry's jurisdiction, with real time updates along with an online complaint/feedback system. (Media CS)
- iii. Establishment of Geo-Data and Geo-Mapping Centres (PFI)



## **SUI NORTHERN GAS PIPELINES LIMITED**

### **MEMORANDUM**

|                         |                                          |
|-------------------------|------------------------------------------|
| From: Company Secretary | To: General Manager (P&D)                |
| Ref. CA/BOD-1/4627      | Thru: <u>DMD (OPS)/SGM (COMPRESSION)</u> |
| December 31, 2020       |                                          |

**CONFIDENTIAL**

### **ITEM-H** **GIS MAPPING PROJECT OF GAS INFRASTRUCTURE**

#### **(SHORT ORDER)**

The Board of Directors considered this agenda item at its 565<sup>th</sup> meeting held on December 31, 2020.

After detailed deliberation, the Board of Directors in line with the recommendation of the Finance and Procurement Committee given at its 315<sup>th</sup> meeting held on December 18, 2020 accorded approval of the following subject to fulfillment and completion of all procedural/ code, legal and financial prerequisites and strictly in accordance with law:

- Carrying out proposed GIS mapping Project's Phase-1A at a total cost of Rs.213.72 Million (Rs. Two Hundred Thirteen million and Seven Hundred Twenty Thousand) comprising Revenue Costs Rs.104.64 million and Capital Costs Rs.109.08 million to be undertaken by obtaining budgetary approval from OGRA.
- Carrying out Phase-1B of the project after the completion of Phase-1A at a total cost of Rs.162.8 Million (Rs. One Hundred Sixty Two million and Eight Hundred Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- Carrying out Phase-2 of the project after the completion of Phase-1 (1A-1B) at a total cost of Rs.132.98 Million (Rs. One Hundred Thirty Two million and Nine Hundred Eighty Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- Enhancement in the cost of Phase-1B and Phase-2 of the project on account of currency fluctuation / inflation, if required at later stage will be sought at inception or during its execution as the said project Phases (Phase-1 B & Phase-2) are to commence after completion of Phase-1 A.
- In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management was allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.

- f) However, the Management was allowed to initiate the processes for material procurement and hiring of resources immediately due to importance of the Project. However, Purchase Orders/resources engagements shall be executed upon receipt of OCRA's approval.

The Managing Director was authorized to take or cause to be taken all the necessary steps to give effect to the above decision.

You are requested to please take further action in this regard. The detailed minutes are under preparation and would be communicated after clearance by the Chairperson, Board of Directors.

  
(IMTIAZ MEHMOOD) —  
Company Secretary

cc: MD  
CFO



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**SUI NORTHERN GAS PIPELINES LIMITED**

Note to Directors

From: Managing Director

Note No. 7323

Dated: December 24, 2020

**AGENDA FOR THE 365<sup>TH</sup> MEETING OF THE BOARD OF DIRECTOR - ITEM-H**

**GIS MAPPING PROJECT OF GAS INFRASTRUCTURE**

This item of the agenda was submitted at the 315<sup>th</sup> meeting of the Finance and Procurement Committee of Directors held on December 18, 2020. Recommendations of the F&PC are attached.

  
(IMTIAZ MEHMOOD)  
Company Secretary

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EXTRACT FROM THE DRAFT MINUTES OF THE 313<sup>TH</sup> FINANCE AND  
PROCUREMENT COMMITTEE OF DIRECTORS HELD ON DECEMBER 18, 2020

5. ITEM-E.GIS MAPPING PROJECT OF GAS INFRASTRUCTURE.

5.9 After detailed deliberation, the Finance and Procurement Committee in line with the recommendation of the Management recommended to the Board of Directors to accord approval in respect of:

- a) Carrying out above proposed GIS mapping Project's Phase-1A at a total cost of Rs.213.72 Million (Rs. Two Hundred Thirteen million and Seven Hundred Twenty Thousand) comprising Revenue Costs Rs.104.64 million and Capital Costs Rs.109.08 million to be undertaken by obtaining budgetary approval from OGRA.
- b) Carrying out Phase-1B of the project after the completion of Phase-1A at a total cost of Rs.162.8 Million (Rs. One Hundred Sixty Two million and Eight Hundred Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- c) Carrying out Phase-2 of the project after the completion of Phase-1 (1A+1B) at a total cost of Rs.132.98 Million (Rs. One Hundred Thirty Two million and Nine Hundred Eighty Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- d) Enhancement in the cost of Phase-1B and Phase-2 of the project on account of currency fluctuation / inflation, if required at later stage will be sought at inception or during its execution as the said project Phases (Phase-1 B & Phase-2) are to commence after completion of Phase-1 A.
- e) In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management may be allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.



## **SUI NORTHERN GAS PIPELINES LIMITED**

Note to Directors

From: Managing Director

Note No.

Dated: 03-12-2020

### **AGENDA FOR FINANCE & PROCUREMENT COMMITTEE MEETING – ITEM NO. E**

#### **GIS MAPPING PROJECT OF GAS INFRASTRUCTURE**

##### **1. Management Request/ Purpose/ Objective:**

GIS is the science of location combined with the analytical powers of computer technology, enabling its users to analyze any location-related issue ranging from simple feasibility study to complex planning jobs. In order to explore the potential advantages of full-fledge GIS in the SNGPL, ArcGIS Enterprise software has been procured and several tasks have been completed as pilot project. The detailed GIS project completion plan was presented in 4<sup>th</sup> RM & UFGCC meeting held on 10-11-2020, and after due deliberation the RM&UFGCC recommended to the F&PC for onward recommending to the Board of Directors to accord approval for its budget to undertake Phase-1A of In-house proposal at an estimated cost of Rs.213.72 Million, whereas Phase-1B at the cost of Rs. 162.80 Million shall be undertaken after completion of Phase-1A and Phase 2 at the cost of Rs.132.98 Million shall be undertaken after completion of Phase-1 (1A+1B), minutes of meeting are enclosed as Annexure-A.

##### **Benefits Of Proposed GIS Project**

The proposed GIS project as outlined above shall have the following major benefits;

1. Conventional paper maps of first 62 SMS clusters (6700 maps in total) will be digitally stored and retrieving any particular map will only take a few minutes.
2. After digitizing all 6700 maps, whole network of aforementioned 62 SMS clusters will be available as a scan-less integrated digital map, with no geo-metrical errors, ensured data security with proper backup/recovery.
3. Data (map) searching, retrieval, analysis, printing and reproduction all will take very minimal time/effort and involve minimal resources that may save 80% cost and time as compared to the existing conventional practice (Annexure-B : Cost-Benefit Analysis).
4. Enterprise GIS portal will be used to share digitized pipeline network across SNGPL, employees will access GIS portal on their computers by using Web browser without any need of additional software installation or intensive training.
5. Implementation of Enterprise GIS drastically improve working efficiency by saving valuable time and eliminating human errors, while enabling its users to effectively plan

- rehabilitation or maintenance activities, manage/monitor their respective pipeline segments/zones/regions right on their desktop across SNGPL.
6. The Enterprise GIS is a game changer that will streamline and centralize all pipeline related information that may connect other enterprise systems already running in the organization.
  7. The ultimate benefit of a full-fledged GIS is an integrated centralized infrastructure information i.e. TBS Service areas, SMS Service areas, Customer data, Pipeline network database and Corrosion related data to help in load management analysis, for controlling the UFG losses and addressing several other operational scenarios.
  8. In recent Covid-19 pandemic and the crisis that emerged due to the Lock down, where employees risked their lives to run critical business operations, a well-established GIS is the answer to all such data availability requirements. Employees may retire/resign/decease but a comprehensive system will remain in its place to serve all stakeholders despite their location or time of the day.

## 2. Financial Information:

The project completion plan consist of two subsequent Phases (1 & 2).

Details are as under:

|                                                                   |                      |
|-------------------------------------------------------------------|----------------------|
| Phase-1A Budget                                                   | = Rs. 213.72 million |
| Phase-1B Budget (to be executed after completion of Phase 1A)     | = Rs. 162.80 million |
| Phase-2 Budget (to be executed after completion of Phase 1 (A+B)) | = Rs. 132.98 million |

## 3. Brief Chronological History:

Live demo of the Pilot GIS Applications/dashboards was presented along with way forward to complete the GIS mapping in the 50<sup>th</sup> UFGCC meeting dated 02-06-2020. The UFGCC Chairman advised to submit a comprehensive plan and need analysis of man power that was further presented in TIP meeting held at 27-08-20, wherein it was decided to prioritize first 62 SMS clusters collectively contributing 85% volumetric losses in overall company's volumetric loss (UFG) for digitizing their downstream gas network in GIS. These 62 SMS clusters include 113 SMSs covered in 6700 Distribution Layout maps that holds approx. 75% of SNGPL's total pipeline network. In line with the Worthy Director's advice for executing this mapping task, two options were considered either to undertake the project purely in-house or to consider out-sourcing. The In-house proposal is divided into Phases i.e. Phase-1 (1A&1B) and Phase-2. The scope of work was also shared with Survey of Pakistan (SOP) to seek their support/services and they estimated Rs.1412 Million to complete Phase-1 (1A+1B) of aforementioned project in 7.8 Years, summary of both proposals is enclosed as Annexure-C and detailed Agenda is enclosed as Annexure-D.

## 4. Budget Information/ Impact on Revenue of the Company:

Budgeted cost of Phase-1A is Rs. 213.72 million and for Phase 1B is Rs. Rs. 162.8 million and Rs. 132.98 million for Phase 2, details of the budget are enclosed as Annexure -E. Phase-1B shall be undertaken after the completion of Phase-1 A, and Phase 2 shall be undertaken after the completion of Phase-1 (A+B). The project will be undertaken after the approval of OGRA. It is expected that OGRA will allow this cost in revenue requirement in the normal course of regulatory process.

## 5. Risks Involved/ Mitigation Strategy:

The proposal includes project-based employment of GIS professionals amounting to Rs. 73.58 million, Rs.137.32 million and Rs.117.18 million in Phase-1A, Phase-1B and

Phase-2 respectively. OGRA is expected to allow this HR cost specific to this project separately from Company's HR benchmark. There is a potential risk that OGRA may not allow this cost separate from HR benchmark and consequently cost exceeding the benchmark may have to be met out of profit.

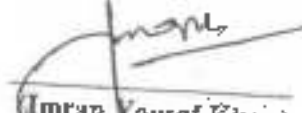
**6. Conformance to Rules/Law:**

It is hereby certified by the management that all procedural, codal, legal and financial pre-requisites shall be fulfilled for completion of the project.

**7. Recommendations:**

It is recommended by the Management to Finance and Procurement Committee of Directors to consider and make recommendations to the Board of Directors for approval in respect of;

- a) Carrying out above proposed GIS mapping Project's Phase-1A at a total cost of Rs.213.72 Million (Rs. Two Hundred Thirteen million and Seven Hundred Twenty Thousand) comprising Revenue Costs Rs.104.64 million and Capital Costs Rs.109.08 million to be undertaken by obtaining budgetary approval from OGRA.
- b) Carrying out Phase-1B of the project after the completion of Phase-1A at a total cost of Rs.162.8 Million (Rs. One Hundred Sixty Two million and Eight Hundred Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- c) Carrying out Phase-2 of the project after the completion of Phase-1 (1A+1B) at a total cost of Rs.132.98 Million (Rs. One Hundred Thirty Two million and Nine Hundred Eighty Thousand) comprising Revenue Costs to be undertaken by obtaining budgetary approval from OGRA.
- d) Enhancement in the cost of Phase-1B and Phase-2 of the project on account of currency fluctuation / inflation, if required at later stage will be sought at inception or during its execution as the said project Phases (Phase-1B & Phase-2) are to commence after completion of Phase-1A.
- e) In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management may be allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.

  
(Imran Yousaf Khan)  
General Manager (P&D)

  
(Asif Akbar Khan)  
Sr. General Manager (ES)

  
(Faissal Iqbal)  
Chief Financial Officer

  
(Sohail M. Gulzar)  
Dy. Managing Director (Ops.)

  
(Amer Tufail)  
Managing Director



**SUI NORTHERN GAS PIPELINES LIMITED**

**MEMORANDUM**

|                                       |                                                                 |
|---------------------------------------|-----------------------------------------------------------------|
| From: Company Secretary               | To: GM (P&D)                                                    |
| Ref. CA/RM&UFG/4183 November 23, 2020 | Thru: SGM (ES)/DMD (OPS) <i>or leave</i><br><b>CONFIDENTIAL</b> |

**EXTRACTS FROM THE DRAFT MINUTES OF THE 41<sup>ST</sup> MEETING OF THE RISK MANAGEMENT & UFG CONTROL COMMITTEE OF DIRECTORS**

Please find below extract(s) from the draft minutes of the 41<sup>st</sup> meeting of the Risk Management & UFG Control Committee of Directors held on November 10, 2020 for your information and necessary action, as well as for immediate response to the queries raised by the worthy Directors, if any, please.

2. **ITEM-B IMPLEMENTATION STATUS OF DECISIONS TAKEN BY THE RISK MANAGEMENT & UFG CONTROL COMMITTEE AT ITS PREVIOUS MEETINGS.**
  - 2.29 Syed Akhtar Ali in conjunction with Dr. Sohail Razi Khan, Members suggested to explore the possibility to adopt Internet of Things (IOT) integration of systems and seamless data flow. However, the Committee advised that at first stage Management should ensure integration of Industrial CMSs with SCADA and with the help of IT/MIS and Telecom departments ensure retrieval of seamless data from EVC installed at Consumers Meter station eliminating the human interference. The Management was also advised to explore EVC data module digital log at the back end to analyze the data at real time for seamless transaction both up front and at back end. The Committee further advised to complete the exercise by June 30, 2021.
  - 2.32 The Committee advised the Management to provide detailed aging analysis pipeline network and provide the compiled data to GM (P&D) for onward integration in the GIS system and to tag the same at TBS level.
  - 2.42 Dr. Sohail Razi Khan, Member suggested that each leaking point should be geo tagged to get its proper rectification. Incharge Corrosion confirmed that all available GPS devices have been provided to the survey teams, however, the process for acquiring additional GPS devices is under process. The Committee advised the Management to put its best efforts by arranging all possible equipments and resources for accomplishment of the given targets.

## 5. ITEM-E GIS MAPPING PROJECT OF GAS INFRASTRUCTURE.

5.1 GM(P&D) was called at the meeting to give presentation on GIS mapping project on gas infrastructure. GM(P&D) gave detailed presentation on the Company's Gas Network Diagram, Objectives of GIS, Completed Tasks, Live Demonstration of GIS Applications/ Dashboards and Way Forward/Project Completion Plan. The Members were also apprised about the benefits of Geographical Information System (GIS), achievements of the department, detailed comparison of In-house project plan with phases vs Survey of Pakistan (SOP) Plan. GM(P&D) informed that GIS development for Transmission network is 100% completed with all information available. Additional dash boards for Customer complaints data and CP leak detection points data is also geo-tagged in GIS. The ultimate goal of a full-fledged GIS is to integrate TBS Service area and SMS service areas with geo-tagged Customers and pipeline network database to help in load management and for controlling the UFG along with addressing several other operational issues. However, the objective of currently proposed project is to convert existing paper maps of Distribution Pipeline network to seamless digital maps (GIS) in order to integrate them with Customer database and other pipeline network related information using GIS technology. This would also help to create a paperless environment with reliable seamless data. The Members were informed that all new Supply main lines and planning of distribution network in new societies is being managed through GIS. The GIS mapping (with 4" and above distribution pipeline network) has been completed for some major cities of franchised areas, however, on the advice of worthy Director, Dr. Sohail Razi Khan, now the focus is being given on the first 62 SMS clusters (highest UFG contributors) to complete their GIS mapping. The worthy Director, Syed Akhtar Ali advised for creating TBS service area boundaries, where GM (UFGC-S) commented that TBS code is being linked with customer database, GM (P&D) assured that TBS service area boundaries will be created in GIS.

5.2 Chairperson inquired if any SOP or manual is established for flow of information to Planning & Development department for compiling the data. GM(P&D) responded in negative. It was advised to develop SOP for transferring of data in intact form to P&D department so that the integrity of data may be ensured. Moreover, shortcomings in the manual of P&D should also be removed. GM(P&D) assured to comply the directions.

5.3 GM(P&D) also gave live demonstration of the Operational dashboards created through GIS for the information of the members. The members were also apprised about the heat map established to find out the high leaking area, pointed out through 1199 complaints Cell along with the status of complaints redressal and data of theft cases.

5.4 The Committee highly appreciated the initiatives taken by the Management for customer complaints redressal. Managing Director informed the Members that the Company's initiatives w.r.t. customer complaints redressal have also been recognized by the Ministry of Energy (Petroleum Division) and the Company has continuously been on number 1 position for addressing the customers' complaints and responding to PMDU portal. Mr. Mohammad Haroon, Member suggested that the Management should strongly use its media for the Company's projection.

- 5.5 The Committee observed that despite making best efforts, the overall image of the Company has not been improved. Managing Director responded that due to pendency of 2.8 million applications and owing to low gas pressure issue especially during the winter months, the Company has to face criticism, besides making its best efforts. However, for creating awareness, Managing Director added that he has already been giving interviews to a number of TV channels and media campaign has also been launched. Moreover, on social media, the overall response is very overwhelming and the viewership of the media campaign has reached to 5 million viewers.
- 5.6 Syed Akhtar Ali, Member suggested that the Company should also explore to get the software for knowing the population of a specific area, which is available with PTCL and he would manage to arrange a meeting with PTCL for getting assistance from them. The worthy Member also suggested that for better data analysis, Report Generator software should be taken to get the desired reports from the available data.
- 5.7 GM(P&D) apprised the Members that the in-house project plan has been divided into two phases (I & II). Phase I is subdivided into IA and IB, where Phase IA covers 4" to 24" dia pipeline network mapping downstream of 113 SMSs of highest UFG prone areas at a total estimated cost of Rs. 213.72 million, while Phase IB covers 1" - 3" dia pipeline network mapping downstream of aforementioned 113 SMSs at a total estimated cost of Rs. 162.80 million. The GIS work on rest of 25% network shall be undertaken in Phase-II at a total estimated cost of Rs. 132.98 million, after completion of phase-I.
- 5.8 After due deliberation the RM&UFGC Committee recommended to the F&PC for onward recommending to the Board to accord approval for its budget for undertaking the Phase-IA of In-house proposal at an estimated cost of Rs. 213.72 million whereas Phase-IB at the cost of Rs. 162.80 million shall be undertaken after completion of phase-I-A.
- 5.9 Dr Sohail Razi Khan, Member recorded his appreciation for the devoted efforts of GM(P&D) & his team and also appreciated the Managing Director for extending full support to P&D. Other Members also acknowledged the dedicated efforts of the Management.

These draft minutes have been circulated amongst the Directors after clearance by the Chairperson of the Risk Management & UFG Control Committee of Directors. Comments, if any, received from them will be communicated in due course of time.

  
(IMTIAZ MEHMOOD)  
Company Secretary

cc: MD

# Cost Benefit Analysis of Proposed GIS Project

| S.No.                              | Task                                   | Way of Working                                                                                   | Process           | Human Resource (a)                       | Equipment (b) | Avg. Time (Days)        | Avg. Cost Rs. (a + b) |
|------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------|-------------------|------------------------------------------|---------------|-------------------------|-----------------------|
| New Map (DCM) Development          | Current Conventional Precise Paper Map | 1- Field Survey (on-foot) to draw sketch map of any location                                     | Surveyor + Driver | Vehicle - Stationary - Plain Paper       | 21 to 35 - 27 | (67500 + 45000) + 30500 |                       |
|                                    |                                        | 2- On-scale drawing of field sketch                                                              | Draughtsman       | Stationary - Plain Paper - Drawing Table | 7 to 14 - 11  | 27500                   |                       |
|                                    |                                        | 3- Field Verification of Scaled Map & Features                                                   | Surveyor + Driver | Vehicle + Stationary - Plain Paper       | 3             | (7500 + 5000) + 5000    |                       |
|                                    |                                        | 4- Verified (Base) maps finalization/ issuing                                                    | Tracer - Officer  | Stationary - Butler Paper                | 1             | (2500 + 5000) + 500     |                       |
|                                    |                                        | 5- Storing finalized Base map (Butler Paper)                                                     | Record Keeper     | Filing Cabinets                          | 0.25          | 500 + 100               |                       |
|                                    |                                        | 6- Printing/ Copying base-map for network planning                                               | Machine Operator  | Automatic machine - Stationary           | 0.5           | 200 + 1000              |                       |
|                                    |                                        | 7- Drawing proposed pipelines Network on base map. Copies/Prints & send to concerned departments | Draughtsman       | Stationary                               | 1             | 2500 + 500              |                       |
|                                    |                                        | 8- M/k long A4-Laid pipelines network on finalized base map (Butler Paper)                       | Draughtsman       | Stationary                               | 1             | 2500 + 500              |                       |
|                                    |                                        | 9- Storing finalized Distribution Layout map                                                     | Record Keeper     | Filing Cabinets                          | 0.25          | 500 + 100               |                       |
|                                    |                                        |                                                                                                  |                   | Total = 7                                | Total = 8     | Total = 45              | Total = 203500        |
| Proposed GIS Technique Digital Map |                                        | 1- Printing Satellite Imagery of a location for Surveyor                                         | GIS Developer     | Printer + Computer + Stationary          | 0.25          | 625 + 500               |                       |
|                                    |                                        | 2- Feature validation of printed Imagery                                                         | Surveyor + Driver | Vehicle - GPS                            | 1             | (7500 + 5000) + 5000    |                       |
|                                    |                                        | 3- On-Screen Digitization of surveyed location (Base map)                                        | GIS Developer     | Computer                                 | 4             | 10000                   |                       |
|                                    |                                        | 4- Storing finalized base map                                                                    | GIS Developer     | Computer                                 | 0.125         | 315                     |                       |
|                                    |                                        | 5- Storing Digital Map with co-ordinates/ departments for network planning                       | GIS Developer     | Computer - Printer + Stationary          | 0.25          | 625 + 500               |                       |
|                                    |                                        | 6- On-Screen Pipeline network digitization on stored base map                                    | GIS Developer     | Computer                                 | 2             | 5000                    |                       |
|                                    |                                        | 7- Storing Digital Map with concerned departments                                                | GIS Developer     | Computer                                 | 0.25          | 625                     |                       |
|                                    |                                        | 8- Storing final Distribution Network map                                                        | GIS Developer     | Computer                                 | 0.125         | 315                     |                       |
|                                    |                                        |                                                                                                  |                   |                                          | Total = 3     | Total = 5               | Total = 10            |

# Summary of GIS Project Completion Plan

| Phase                | SAP/50<br>(6)<br>Cust<br>(ers) | ADAPS<br>/ DLMs | Pipeline<br>Network | Completion<br>Time | SNGPL's<br>Total<br>Network<br>%age | ITR Cost<br>Rs.<br>Million | IT<br>Infrastructure +<br>Rental +<br>Miscellaneous<br>Cost Rs.<br>Million | Total<br>Cost<br>Rs.<br>Million | Survey of Pakistan's<br>Proposal              |                                                       |                              |
|----------------------|--------------------------------|-----------------|---------------------|--------------------|-------------------------------------|----------------------------|----------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------------------------------------------------|------------------------------|
|                      |                                |                 |                     |                    |                                     |                            |                                                                            |                                 | Data<br>Development<br>Cost<br>Rs.<br>Million | Contingency +<br>Miscellaneous<br>Cost Rs.<br>Million | Total<br>Cost Rs.<br>Million |
| Phase I (A)          | 113                            | 6700            | 4" - 24" dia        | 3 Year             | 35%                                 | 75.58                      | 140.14                                                                     | 213.72                          |                                               |                                                       |                              |
| Phase I (B)          | 143                            | 6700            | 1" - 3" dia         | 4 Year             | 40%                                 | 137.32                     | 35.48                                                                      | 162.80                          | 563.60                                        | 848.47                                                | 1412.08                      |
| Total                |                                |                 |                     |                    |                                     |                            |                                                                            |                                 |                                               |                                                       |                              |
| Phase 1<br>(A + B)   | 113                            | 6700            | 1" - 24" dia        | 7 Years            | 75%                                 | 210.9                      | 165.62                                                                     | 376.52                          | 563.60                                        | 848.47                                                | 1412.08                      |
| Phase 2              |                                |                 |                     |                    |                                     |                            |                                                                            |                                 |                                               |                                                       |                              |
| Total                |                                |                 |                     |                    |                                     |                            |                                                                            |                                 |                                               |                                                       |                              |
| Phase 1 +<br>Phase 2 | 449                            | 9300            | 1" - 24" dia        | 9.5 Years          | 100%                                | 328.08                     | 181.82                                                                     | 509.5                           |                                               |                                                       |                              |

227  
Annex-C  
97

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**SUI NORTHERN GAS PIPELINES LIMITED**

Note to Directors

From: Managing Director

Note No.

Dated: 03-11-2020

**AGENDA FOR RISK MANAGEMENT AND UFG CONTROL COMMITTEE  
MEETING – ITEM NO.**

**GIS MAPPING PROJECT OF GAS INFRASTRUCTURE**

**1. Management Request/ Purpose/ Objective:**

GIS is a revolutionary technology, being used globally for critical decision making, planning/monitoring and asset management particularly in the Public sector organizations. Implementation of GIS will drastically improve working efficiency by saving valuable time and eliminating human errors, while enabling its users to effectively plan rehabilitation or maintenance activities, manage/monitor their respective pipeline segments/areas/regions right on their desktop across SNGPL. P&D Department had started converting conventional maps to GIS as an in-house job with available limited resources, and presented their work and highlighted completed tasks in 50<sup>th</sup> UFGCC Meeting held at 02.05.2020. It was also informed that additional resources i.e. HR, IT equipment and Space etc. shall be required for earliest completion of mapping job. In this regard Chairman UFGCC advised to submit a comprehensive plan and need analysis of man power. Further, in 110<sup>th</sup> meeting held at 27-08-20, it was decided to prioritize Highest UFG-wise 62 SMS clusters for digitizing their downstream gas network in GIS. SNGPL has planned its GIS project to be completed in 02 Phases. Phase 1 comprises GIS development work of distribution network downstream of 113 SMSs out of 449 SMSs which is 75% of the Company's total network, while balance 25% of the Company's network falls in Phase 2. Phase 1 is further divided into 1A & 1B, 1A covers 4" and above dia network that shall be completed in 03 years, while 1B covers 1" to 3" dia network that will be completed in next 04 years. Total 30 Human Resources have been planned to undertake Phase 1A.

**2. Financial Information:**

In-house project plan consist of two subsequent Phases (1 & 2), whereas Phase 1 is further divided into Phase 1A and Phase 1B. Details are as under:

|                                                                 |                      |
|-----------------------------------------------------------------|----------------------|
| Phase 1 (1A + 1B) Total Budget                                  | - Rs. 376.52 million |
| Phase 2 Budget (to be executed after the completion of Phase 1) | - Rs.132.98 Million  |

**3. Brief Chronological History:**

So far several crucial milestones have been achieved, the Supply-mains and Transmission lines planning & proposal development job is shifted exclusively on GIS maps. GIS development for Transmission network is 100% completed. The Distribution network's

GIS is in its foundation stage, where Maps of some major cities (i.e. Lahore, Shikhpura, Islamabad, Rawalpindi and Sahiwal) are completed with pipeline network 4" and above diameter. In order to share and to centralize all pipeline infrastructure-related data, ArcGIS Enterprise software has been installed on Company's server. Web GIS Applications and interactive dashboards created through Enterprise GIS are facilitating SNGPL's management in decision making and monitoring Customer Complaints (1199), Defaulter Customers, Gas Theft Cases and Leak Detection through interactive concentration/heat maps.

Budget estimates have also been taken from the Survey of Pakistan who are already engaged in similar jobs. They have submitted Rs. 1412.08 Million cost estimate for undertaking Phase 1 job whereas SNGPL has worked out its cost amounting Rs. 376.52 Million for the same.

4. **Budget Information/ Impact on Revenue of the Company:**

Budget amounting to Rs. 376.52 Millions (for undertaking Phase 1) is required for additional resources. Phase 2 shall be undertaken after the completion of Phase 1.

5. **Risks Involved/ Mitigation Strategy:**

None.

6. **Conformance to Rules/Law:**

It is hereby certified by the management that all procedural, codal, legal and financial pre-requisites shall be fulfilled for completion of the project.

7. **Recommendations:**

It is recommended by the management to consider the agenda and further recommend to the Board of Directors through Finance & Procurement Committee for its approval for undertaking the job in-house.

  
(Imran Yousaf Khan)  
General Manager (P&ID)

  
03/11/20  
(Asif Akbar Khan)  
Sr. General Manager (BS)

  
(Faisal Iqbal)  
Chief Financial Officer

  
(Amer Tufail)  
Managing Director

## SUI NORTHERN GAS PIPELINES LIMITED

### AGENDA FOR RISK MANAGEMENT AND LPG CONTROL COMMITTEE MEETING - ITEM NO.

#### GIS MAPPING PROJECT OF GAS INFRASTRUCTURE

Geographic Information System (GIS) is a revolutionary technology that is being globally implemented for critical decision making, planning/monitoring and asset management particularly in the Public sector organizations. GIS is the science of location combined with the analytical powers of computer technology, enabling its users to analyze any location-related issue ranging from simple feasibility study to complex planning jobs. Public sector organizations hold a larger service area that requires a robust monitoring & management system, and their decision support system is more reliable and accurate when aided with GIS because of accurate location based information. Generally GIS development process involves conventional maps scanning, geo-referencing, Geo-database designing and digitizing with tabular information and their superimposition on satellite imagery to produce accurate digital maps that provide wide array of analytical tools.

The SNGPL's pipeline network is the largest pipeline system of Pakistan, sprawling over very large franchise area that was in dire need of an efficient solution like GIS for managing, monitoring, planning and decision making of such a complex network. In recent Covid-19 pandemic and the crisis that emerged due to the Lock down, where employees are risking their lives to run critical business operations, a well-established GIS is the answer to all such data availability requirements. Employees may retire/resign/decease but a comprehensive system will remain in its place to serve all stakeholder despite their location or time of the day. Implementation of Enterprise GIS drastically improve working efficiency by saving valuable time and eliminating human errors, while enabling its users to effectively plan rehabilitation or maintenance activities, manage/monitor their respective pipeline segments/areas/regions right on their desktop across SNGPL. An Enterprise GIS is a game changer to streamline and centralize all pipeline related information that may connect other enterprise systems already running in the organization.

So far we have successfully achieved several crucial milestones. The Supply-main lines and Transmission lines planning & proposal development is shifted exclusively on GIS maps. GIS development for Transmission network is 100% completed with all information available in Valve notations i.e. diameter, pipeline name, valve assembly, SMS, repeater Station, compressor station and Mile posts. The Distribution network's GIS is in its foundation stage, where Maps of some major cities (i.e. Lahore, Shiekhupura, Islamabad, Rawalpindi and Sahiwal) are completed with pipeline network 4" and above diameter by the existing 03 no. in-house GIS professionals. In order to share these digital maps with concerned employees across SNGPL and to centralize all pipeline infrastructure-related data, a state-of-the-art Enterprise GIS software (ArcGIS Enterprise) has been installed on Company's server. Web GIS Applications (for both Transmission and Distribution networks so far completed) are also developed that can be accessed on any user's desktops across SNGPL's franchise offices using web browser.

The dashboards created through Enterprise GIS are facilitating SNGPL's management in decision making and monitoring Customer Complaints (199), Defaulter Customers, Gas Theft Cases and Leak Detection through interactive concentration/heat maps. GIS Web application can also provide CP protection levels concentration on existing pipeline network maps for a thorough analysis of existing CP protection status using CP Test point values along with many other analytical insights.

Live demo of GIS Applications/dashboards was presented in 50<sup>th</sup> UFGCC meeting dated 02-06-2020 along with way forward to complete the GIS mapping of distribution pipeline network within shortest possible time. It was advised by the UFGCC Chairman to submit a comprehensive plan and need analysis of man power. Further, in TIP meeting held at 27-08-20, it was decided to prioritize first 62 SMS clusters collectively contributing 85% volumetric losses in overall company's volumetric loss (UFG) for digitizing their downstream gas network in GIS. These 62 SMS clusters include 113 SMSs (Annexure A), whereas their downstream network is comprised of 6700 Distribution Layout maps that covers approx. 75% of SNGPL's total pipeline network.

### In-house Project Plan With Phases

Keeping in view the quantum of work involved and its earliest completion, a comprehensive plan has been prepared (Annexure B) to complete the mapping of aforementioned 62 SMS clusters (downstream pipeline network). In this regard a team of 30 trained GIS Professionals (initially on extendable Contract base that may gradually be absorbed as Permanent Executives) shall be required to complete the planned jobs within stipulated time frame. Manpower need analysis is enclosed (Annexure C). The brief summary of completion plan is as following.

| Summary of GIS Project Completion Plan (In-House) 113 SMSs/ 6700 Maps - Phase 1 |                  |                 |                            |                     |                                                             |                        |
|---------------------------------------------------------------------------------|------------------|-----------------|----------------------------|---------------------|-------------------------------------------------------------|------------------------|
| Phase 1                                                                         | Pipeline Network | Completion Time | SNGPL's Total Network %age | HR Cost Rs. Million | IT Infrastructure + Rental + Miscellaneous Cost Rs. Million | Total Cost Rs. Million |
| 1A                                                                              | 1"- 24" dia      | 3 Year          | 35%                        | 73.58               | 140.14                                                      | 213.72                 |
| 1B                                                                              | 2"- 3' dia       | 4 Year          | 40%                        | 137.32              | 25.48                                                       | 162.80                 |
| Total                                                                           | 1"- 24" dia      | 7 Year          | 75%                        | 210.9               | 165.62                                                      | 376.52                 |

Rest of the 25% SNGPL network comprise of 336 SMSs and 2600 Maps can be taken up as Phase 2 after completion of Phase 1, brief summary is as following:

| Summary of GIS Project Completion Plan (In-House) 336 SMSs/ 2600 Maps - Phase 2 |                  |                 |                            |                     |                                                             |                        |
|---------------------------------------------------------------------------------|------------------|-----------------|----------------------------|---------------------|-------------------------------------------------------------|------------------------|
| Phase                                                                           | Pipeline Network | Completion Time | SNGPL's Total Network %age | HR Cost Rs. Million | IT Infrastructure + Rental + Miscellaneous Cost Rs. Million | Total Cost Rs. Million |
| 2                                                                               | 1"- 24" dia      | 2.5 Year        | 25%                        | 117.18              | 13.8                                                        | 132.98                 |

Breakup of the budgeted cost is enclosed as Annexure-D.

Enhancement in the cost of Phase 2 of the project may be sort on account of currency fluctuation/inflation if any at that time, as the Phase 2 is to commence after the completion of Phase 1.

### Survey of Pakistan (SOP) Plan

Aforementioned scope of work was also shared with Survey of Pakistan (SOP), who are also engaged in similar jobs vide Letter No. P&D/02-14257 dated: 12.09.2020 (Annexure E) to sought their support and proposal. Several detailed meetings during last two months (Sep-Oct 2020) were held with SOP's technical team to clarify the scope of work following which they provided complete proposal covering cost and timelines with 567 Human resources that is enclosed as Annexure F, a brief summary is as following:

| Survey of Pakistan (SOP)'s Proposal Summary of GIS Project Completion 113 SMSs/ 6700 Maps |                  |                 |                            |                     |                                                             |                        |
|-------------------------------------------------------------------------------------------|------------------|-----------------|----------------------------|---------------------|-------------------------------------------------------------|------------------------|
| Phase                                                                                     | Pipeline Network | Completion Time | SNGPL's Total Network %age | HA Cost Rs. Million | IT Infrastructure + Rental + Miscellaneous Cost Rs. Million | Total Cost Rs. Million |
| I                                                                                         | 1" to 24" dia    | 7.8 Years       | 75%                        | 745.78              | 666.33                                                      | 1412.08                |

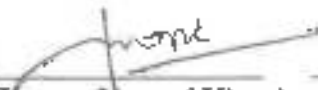
### Summary:

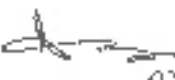
| In-House Proposal                  | Survey of Pakistan (SOP) Proposal    |
|------------------------------------|--------------------------------------|
| 6700 Sheets (1" to 24") in 7 Years | 6700 Sheets (1" to 24") in 7.8 Years |
| Cost = Rs. 376.52 Million          | Cost = Rs. 1412.08 Million           |

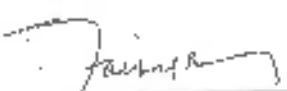
It is evident from above that In-House proposal is most feasible solution that will utilize optimal resources to complete the aforementioned mapping task in stipulated timeframe.

### Recommendation:

It is recommended by the management to consider the agenda and if deemed appropriate further recommend to the Board of Directors through Finance & Procurement Committee for its approval for undertaking the job in-house.

  
(Muran Yousaf Khan)  
General Manager (P&D)

  
03/11/20  
(Asif Akbar Khan)  
Sr. General Manager (ES)

  
(Faisal Iqbal)  
Chief Financial Officer

*on leave*  
(Sohail M. Gulzar)  
Dy. Managing Director (Ops.)

  
(Amer Tufail)  
Managing Director

# UPG Volume Wise First 62 SMS's Clusters Contributing to 85% Volumetric Losses

| Cluster No. | Sr. No. | Region               | SMS                     |
|-------------|---------|----------------------|-------------------------|
| 1           | 1       | Lahore East/ West    | B-3 Shalidara           |
|             | 2       | Lahore East/ West    | SMS II                  |
|             | 3       | Lahore East/ West    | SMS 10.                 |
| 2           | 4       | Peshawar             | Peshawar                |
|             | 5       | Peshawar             | Khanzara                |
|             | 6       | Peshawar             | Pahbi                   |
|             | 7       | Peshawar             | New Pahbi               |
|             | 8       | Peshawar             | Regi Medel Town         |
| 3           | 9       | Islamabad/Rawalpindi | Ranjel                  |
|             | 10      | Islamabad/Rawalpindi | Rawat                   |
|             | 11      | Islamabad/Rawalpindi | Kanghazi                |
|             | 12      | Islamabad/Rawalpindi | Nizone                  |
|             | 13      | Islamabad/Rawalpindi | CMII / MH               |
| 4           | 14      | Faisalabad           | Faisalabad IV           |
|             | 15      | Faisalabad           | Faisalabad I            |
|             | 16      | Faisalabad           | Faisalabad III          |
|             | 17      | Faisalabad           | Gutwala (I+II)          |
|             | 18      | Faisalabad           | Faisalabad VI           |
|             | 19      | Faisalabad           | Millet Town             |
|             | 20      | Faisalabad           | Small Indus (V)         |
|             | 21      | Multan               | Multan I                |
| 5           | 22      | Multan               | Multan V                |
|             | 23      | Multan               | Multan IV               |
|             | 24      | Multan               | Multan Wapda            |
|             | 25      | Multan               | Indus, Extara           |
|             | 26      | Multan               | Jahangirabad            |
|             | 27      | Gujranwala           | Gujranwala              |
| 7           | 28      | Peshawar             | Kahol                   |
|             | 29      | Peshawar             | Kohal Operational Phase |
| 8           | 30      | Mardan               | Mardan                  |
|             | 31      | Mardan               | Promer Sugar Mills      |
| 9           | 32      | Sheikhpura           | Punjab Steel            |
|             | 33      | Sheikhpura           | GTPS Sheikhdara         |
|             | 34      | Sheikhpura           | B-3 Shalidara           |

|    |    |                      |                    |
|----|----|----------------------|--------------------|
| 10 | 35 | Islamabad/Rawalpindi | Pindus             |
|    | 36 | Islamabad/Rawalpindi | Chakwal            |
|    | 37 | Islamabad/Rawalpindi | Tamman             |
|    | 38 | Islamabad/Rawalpindi | Yernu              |
|    | 39 | Islamabad/Rawalpindi | Satwala            |
|    | 40 | Islamabad/Rawalpindi | Ghugy Mor          |
| 11 | 41 | Peshawar             | Charsadda          |
|    | 42 | Peshawar             | Rajinr             |
|    | 43 | Peshawar             | Duulapora          |
|    | 44 | Peshawar             | Wali Bagh          |
| 12 | 45 | Sheikhupura          | General Industries |
|    | 46 | Sheikhupura          | Sheikhupura        |
|    | 47 | Sheikhupura          | Dhokki             |
| 13 | 48 | Lahore East/ West    | Manga Mandi        |
| 14 | 49 | Multan               | Muzaffar Garh City |
|    | 50 | Multan               | Shah Jangal        |
|    | 51 | Multan               | Rukn-e-Wali        |
|    | 52 | Multan               | Chiyak Pannit      |
| 15 | 53 | Peshawar             | Birana             |
| 16 | 54 | Sargodha             | Sargodha           |
| 17 | 55 | Multan               | Kaikiyala          |
|    | 56 | Multan               | Khanewal           |
|    | 57 | Multan               | Ranapur            |
| 18 | 58 | Gujrat               | Gujrat             |
| 19 | 59 | Sialkot              | Sialkot            |
| 20 | 60 | Bahawalpur           | Sadiqabad          |
| 21 | 61 | Bahawalpur           | Rabim Yar Khan     |
| 22 | 62 | Islamabad/Rawalpindi | Wala               |
|    | 63 | Islamabad/Rawalpindi | H.M.C. Taxila      |
|    | 64 | Islamabad/Rawalpindi | Margalla Hills     |
| 23 | 65 | Mardan               | Takht-e-Nabi       |
| 24 | 66 | Lahore East/ West    | Patoki             |
| 25 | 67 | Peshawar             | Umer Zai           |
| 26 | 68 | Lahore East/ West    | Nisbat Chaudhary   |
| 27 | 69 | Bahawalpur           | Bahawalpur         |
|    | 70 | Bahawalpur           | Lodhran            |
| 28 | 71 | Multan               | Dera Ghazi Khan    |
|    | 72 | Multan               | Sirf Sadar ur Din  |
| 29 | 73 | Mardan               | Noohara Cantt.     |
| 30 | 74 | Mardan               | Sakia Kot          |

|    |     |                      |                                 |
|----|-----|----------------------|---------------------------------|
| 31 | 75  | Islamabad/Rawalpindi | Gujjar Khan                     |
|    | 76  | Islamabad/Rawalpindi | Pindori                         |
| 32 | 77  | Islamabad/Rawalpindi | Sanjwal (Attock)                |
|    | 78  | Islamabad/Rawalpindi | Kumra                           |
| 33 | 79  | Peshawar             | Hargu                           |
| 34 | 80  | Sialkot              | Daska                           |
| 35 | 81  | Islamabad/Rawalpindi | Sitai Alangir                   |
|    | 82  | Islamabad/Rawalpindi | Tholun                          |
| 36 | 83  | Mardan               | Noohra Kelen                    |
| 37 | 84  | Iduftan              | Tiba Sirtan                     |
| 38 | 85  | Faisalabad           | Chak Haura                      |
| 39 | 86  | Faisalabad           | Jamwala                         |
| 40 | 87  | Mardan               | Sweet and Sargote Line          |
| 41 | 88  | Mardan               | Risapur                         |
| 42 | 89  | Mardan               | Zaida                           |
| 43 | 90  | Gujranwala           | Muzabad                         |
| 44 | 91  | Gujranwala           | Emmabad                         |
| 45 | 92  | Islamabad/Rawalpindi | Hazo                            |
|    | 93  | Islamabad/Rawalpindi | Gharz                           |
| 46 | 94  | Faisalabad           | Chiniot                         |
|    | 95  | Faisalabad           | Pindi Bhattian                  |
| 47 | 96  | Sheikhpura           | Parogabad                       |
| 48 | 97  | Faisalabad           | Toba Tak Singh                  |
| 49 | 98  | Sohawal              | Chongra Mian Khan               |
|    | 99  | Bahawal              | Depalpur                        |
| 50 | 100 | Islamabad/Rawalpindi | Danftala                        |
| 51 | 101 | Faisalabad           | Rumandri                        |
|    | 102 | Faisalabad           | Gojra                           |
| 52 | 103 | Islamabad/Rawalpindi | Pindi Ghat                      |
| 53 | 104 | Sheikhpura           | Naukan Sahib                    |
| 54 | 105 | Peshawar             | Dera Ismail Khan                |
| 55 | 106 | Mardan               | Mian Channu                     |
| 56 | 107 | Lehona East/ West    | Industrial Cluster (Food Block) |
| 57 | 108 | Faisalabad           | Jhang                           |
| 58 | 109 | Sialkot              | Badina                          |
| 59 | 110 | Sargodha             | Bahawal                         |
| 60 | 111 | Gujranwala           | Wazirabad                       |
| 61 | 112 | Gujranwala           | Pindi Bhattian                  |
| 62 | 113 | Mardan               | Akora Town                      |

| Cluster No. | Sr. No. | Region  | SMS          | D/M | Year 1    |           |           |           | Year 2    |           |           |           | Year 3    |           |           |           |
|-------------|---------|---------|--------------|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|             |         |         |              |     | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 |
| 2           | 1       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 2       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 3       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 4       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 3           | 5       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 6       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 7       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 8       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 4           | 9       | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 10      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 11      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 12      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 5           | 13      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 14      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 15      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 16      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 6           | 17      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 18      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 19      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 20      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 7           | 21      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 22      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 23      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 24      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 8           | 25      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 26      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 27      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 28      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 9           | 29      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 30      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 31      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 32      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 10          | 33      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 34      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 35      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 36      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
| 11          | 37      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 38      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 39      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 40      | Lebanon | B-S-Sinidars |     |           |           |           |           |           |           |           |           |           |           |           |           |

Phase 1A

CIS Mapping Project Plan of 62 SMSs  
 Clusters 1-10 Volume Wise (Calculated on  
 the basis of 30 trained GIS Professionals  
 for 4 inch and above diameter pipeline  
 network)

06

Phase 1A

GIS Mapping Project Plan of 62 SMSs  
Clusters UFG Volume Wise (Calculated on  
the basis of 30 trained UFG Professionals  
for 4 inch and above diameter pipeline  
in meters)

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    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  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | 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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |   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| 11 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 522 | 523 | 524 | 525 | 526 | 527 | 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 | 538 | 539 | 540 | 541 | 542 | 543 | 544 | 545 | 546 | 547 | 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 | 558 | 559 | 560 | 561 | 562 | 563 | 564 | 565 | 566 | 567 | 568 | 569 | 570 | 571 | 572 | 573 | 574 | 575 | 576 | 577 | 578 | 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 | 588 | 589 | 590 | 591 | 592 | 593 | 594 | 595 | 596 | 597 | 598 | 599 | 600 | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 | 616 | 617 | 618 | 619 | 620 | 621 | 622 | 623 | 624 | 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 | 635 | 636 | 637 | 638 | 639 | 640 | 641 | 642 | 643 | 644 | 645 | 646 | 647 | 648 | 649 | 650 | 651 | 652 | 653 | 654 | 655 | 656 | 657 | 658 | 659 | 660 | 661 | 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | 671 | 672 | 673 | 674 | 675 | 676 | 677 | 678 | 679 | 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 | 693 | 694 | 695 | 696 | 697 | 698 | 699 | 700 | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 | 718 | 719 | 720 | 721 | 722 | 723 | 724 | 725 | 726 | 727 | 728 | 729 | 730 | 731 | 732 | 733 | 734 | 735 | 736 | 737 | 738 | 739 | 740 | 741 | 742 | 743 | 744 | 745 | 746 | 747 | 748 | 749 | 750 | 751 | 752 | 753 | 754 | 755 | 756 | 757 | 758 | 759 | 760 | 761 | 762 | 763 | 764 | 765 | 766 | 767 | 768 | 769 | 770 | 771 | 772 | 773 | 774 | 775 | 776 | 777 | 778 | 779 | 780 | 781 | 782 | 783 | 784 | 785 | 786 | 787 | 788 | 789 | 790 | 791 | 792 | 793 | 794 | 795 | 796 | 797 | 798 | 799 | 800 | 801 | 802 | 803 | 804 | 805 | 806 | 807 | 808 | 809 | 810 | 811 | 812 | 813 | 814 | 815 | 816 | 817 | 818 | 819 | 820 | 821 | 822 | 823 | 824 | 825 | 826 | 827 | 828 | 829 | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 | 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 | 849 | 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 | 859 | 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 | 869 | 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 | 879 | 880 | 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 | 889 | 890 | 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 | 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 | 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 | 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 | 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 | 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 | 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 | 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 | 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 | 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 | 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 | 1081 | 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 | 1091 | 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 | 1101 | 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 | 1111 | 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 | 1121 | 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 | 1131 | 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1139 | 1140 | 1141 | 1142 | 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 | 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 | 1161 | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 | 1171 | 1172 | 1173 | 1174 | 1175 | 1176 | 1177 | 1178 | 1179 | 1180 | 1181 | 1182 | 1183 | 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1190 | 1191 | 1192 | 1193 | 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 | 1202 | 1203 | 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 | 1212 | 1213 | 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1220 | 1221 | 1222 | 1223 | 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1230 | 1231 | 1232 | 1233 | 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1240 | 1241 | 1242 | 1243 | 1244 | 1245 | 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1263 | 1264 | 1265 | 1266 | 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 | 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 | 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 | 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 | 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 | 1329 | 1330 | 1331 | 1332 | 1333 | 1334 | 1335 | 1336 | 1337 | 1338 | 1339 | 1340 | 1341 | 1342 | 1343 | 1344 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 | 1354 | 1355 | 1356 | 1357 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 | 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1383 | 1384 | 1385 | 1386 | 1387 | 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 | 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 | 1410 | 1411 | 1412 | 1413 | 1414 | 1415 | 1416 | 1417 | 1418 | 1419 | 1420 | 1421 | 1422 | 1423 | 1424 | 1425 | 1426 | 1427 | 1428 | 1429 | 1430 | 1431 | 1432 | 1433 | 1434 | 1435 | 1436 | 1437 | 1438 | 1439 | 1440 | 1441 | 1442 | 1443 | 1444 | 1445 | 1446 | 1447 | 1448 | 1449 | 1450 | 1451 | 1452 | 1453 | 1454 | 1455 | 1456 | 1457 | 1458 | 1459 | 1460 | 1461 | 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1468 | 1469 | 1470 | 1471 | 1472 | 1473 | 1474 | 1475 | 1476 | 1477 | 1478 | 1479 | 1480 | 1481 | 1482 | 1483 | 1484 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492 | 1493 | 1494 | 1495 | 1496 | 1497 | 1498 | 1499 | 1500 | 1501 | 1502 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-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| Cluster No. | Sr. No. | Region | S445         | DIN | Year 1    |           |           |           | Year 2    |           |           |           | Year 3    |           |           |           | Year 4    |           |           |           |
|-------------|---------|--------|--------------|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|             |         |        |              |     | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 |
| 1           | 1       | Edara  | 8-3 Brubara  |     |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 2       | Edara  | 8-4 Brubara  | 123 | 4106703   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 3       | Edara  | 8-5 Brubara  |     | 11 5063   |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 4       | Edara  | 8-6 Brubara  |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 2           | 5       | Edara  | 8-7 Brubara  | 873 | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 6       | Edara  | 8-8 Brubara  | 75  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 7       | Edara  | 8-9 Brubara  | 23  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 8       | Edara  | 8-10 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 3           | 9       | Edara  | 8-11 Brubara | 2   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 10      | Edara  | 8-12 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 11      | Edara  | 8-13 Brubara | 23  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 12      | Edara  | 8-14 Brubara | 24  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 4           | 13      | Edara  | 8-15 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 14      | Edara  | 8-16 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 15      | Edara  | 8-17 Brubara | 51  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 16      | Edara  | 8-18 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 5           | 17      | Edara  | 8-19 Brubara | 4   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 18      | Edara  | 8-20 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 19      | Edara  | 8-21 Brubara | 213 | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 20      | Edara  | 8-22 Brubara | 35  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 6           | 21      | Edara  | 8-23 Brubara | 296 | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 22      | Edara  | 8-24 Brubara | 23  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 23      | Edara  | 8-25 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 24      | Edara  | 8-26 Brubara | 20  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 7           | 25      | Edara  | 8-27 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 26      | Edara  | 8-28 Brubara | 24  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 27      | Edara  | 8-29 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 28      | Edara  | 8-30 Brubara | 36  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 8           | 29      | Edara  | 8-31 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 30      | Edara  | 8-32 Brubara | 20  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 31      | Edara  | 8-33 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 32      | Edara  | 8-34 Brubara | 24  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 9           | 33      | Edara  | 8-35 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 34      | Edara  | 8-36 Brubara | 36  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 35      | Edara  | 8-37 Brubara |     | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 36      | Edara  | 8-38 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 10          | 37      | Edara  | 8-39 Brubara | 20  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 38      | Edara  | 8-40 Brubara | 1   | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 39      | Edara  | 8-41 Brubara | 24  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|             | 40      | Edara  | 8-42 Brubara | 36  | 12 845701 |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |

Phase 1B

G-5 Mapping Project Plan of 82  
 Sites Cluster U-13 Volume  
 Wise (Calculated on the basis of  
 30 Inland GIS Professionals for 1  
 inch and above diameter pipeline  
 network)



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| ST | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 | 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 | 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 | 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 | 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 | 518 | 519 | 520 | 521 | 522 | 523 | 524 | 525 | 526 | 527 | 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 | 538 | 539 | 540 | 541 | 542 | 543 | 544 | 545 | 546 | 547 | 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 | 558 | 559 | 560 | 561 | 562 | 563 | 564 | 565 | 566 | 567 | 568 | 569 | 570 | 571 | 572 | 573 | 574 | 575 | 576 | 577 | 578 | 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 | 588 | 589 | 590 | 591 | 592 | 593 | 594 | 595 | 596 | 597 | 598 | 599 | 600 | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 | 616 | 617 | 618 | 619 | 620 | 621 | 622 | 623 | 624 | 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 | 635 | 636 | 637 | 638 | 639 | 640 | 641 | 642 | 643 | 644 | 645 | 646 | 647 | 648 | 649 | 650 | 651 | 652 | 653 | 654 | 655 | 656 | 657 | 658 | 659 | 660 | 661 | 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | 671 | 672 | 673 | 674 | 675 | 676 | 677 | 678 | 679 | 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 | 693 | 694 | 695 | 696 | 697 | 698 | 699 | 700 | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 | 718 | 719 | 720 | 721 | 722 | 723 | 724 | 725 | 726 | 727 | 728 | 729 | 730 | 731 | 732 | 733 | 734 | 735 | 736 | 737 | 738 | 739 | 740 | 741 | 742 | 743 | 744 | 745 | 746 | 747 | 748 | 749 | 750 | 751 | 752 | 753 | 754 | 755 | 756 | 757 | 758 | 759 | 760 | 761 | 762 | 763 | 764 | 765 | 766 | 767 | 768 | 769 | 770 | 771 | 772 | 773 | 774 | 775 | 776 | 777 | 778 | 779 | 780 | 781 | 782 | 783 | 784 | 785 | 786 | 787 | 788 | 789 | 790 | 791 | 792 | 793 | 794 | 795 | 796 | 797 | 798 | 799 | 800 | 801 | 802 | 803 | 804 | 805 | 806 | 807 | 808 | 809 | 810 | 811 | 812 | 813 | 814 | 815 | 816 | 817 | 818 | 819 | 820 | 821 | 822 | 823 | 824 | 825 | 826 | 827 | 828 | 829 | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 | 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 | 849 | 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 | 859 | 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 | 869 | 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 | 879 | 880 | 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 | 889 | 890 | 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 | 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 | 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 | 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 | 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 | 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 | 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 | 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 | 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 | 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 | 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 | 1081 | 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 | 1091 | 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 | 1101 | 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 | 1111 | 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 | 1121 | 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 | 1131 | 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1139 | 1140 | 1141 | 1142 | 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 | 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 | 1161 | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 | 1171 | 1172 | 1173 | 1174 | 1175 | 1176 | 1177 | 1178 | 1179 | 1180 | 1181 | 1182 | 1183 | 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1190 | 1191 | 1192 | 1193 | 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 | 1202 | 1203 | 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 | 1212 | 1213 | 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1220 | 1221 | 1222 | 1223 | 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1230 | 1231 | 1232 | 1233 | 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1240 | 1241 | 1242 | 1243 | 1244 | 1245 | 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1263 | 1264 | 1265 | 1266 | 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 | 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 | 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 | 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 | 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 | 1329 | 1330 | 1331 | 1332 | 1333 | 1334 | 1335 | 1336 | 1337 | 1338 | 1339 | 1340 | 1341 | 1342 | 1343 | 1344 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 | 1354 | 1355 | 1356 | 1357 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 | 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1383 | 1384 | 1385 | 1386 | 1387 | 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 | 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 | 1410 | 1411 | 1412 | 1413 | 1414 | 1415 | 1416 | 1417 | 1418 | 1419 | 1420 | 1421 | 1422 | 1423 | 1424 | 1425 | 1426 | 1427 | 1428 | 1429 | 1430 | 1431 | 1432 | 1433 | 1434 | 1435 | 1436 | 1437 | 1438 | 1439 | 1440 | 1441 | 1442 | 1443 | 1444 | 1445 | 1446 | 1447 | 1448 | 1449 | 1450 | 1451 | 1452 | 1453 | 1454 | 1455 | 1456 | 1457 | 1458 | 1459 | 1460 | 1461 | 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1468 | 1469 | 1470 | 1471 | 1472 | 1473 | 1474 | 1475 | 1476 | 1477 | 1478 | 1479 | 1480 | 1481 | 1482 | 1483 | 1484 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492 | 1493 | 1494 | 1495 | 1496 | 1497 | 1498 | 1499 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----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### Human Resource Need Analysis for GIS Project

| Job Description/<br>Major Task                                          | Existing  | Required  | Qualification                                            | Minimum<br>Experience | Skill-set                                                                                         | Employment<br>Status                                                   |
|-------------------------------------------------------------------------|-----------|-----------|----------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| GIS Project Lead/<br>Team & Project<br>Management                       | 01        | -         | PhD (GIS/<br>Geomatics)                                  | 20 years              | GIS Project planning,<br>Management &<br>Execution, Specialized<br>GIS/RS Skills                  | Permanent<br>Executive<br>(Existing)                                   |
| GIS Expert/<br>Development<br>Supervision                               | 02        | -         | M.Phil/ MSc (GIS/<br>Geomatics)                          | 10 years              | Expert GIS/RS skills and<br>Advance GIS Data<br>development Skill                                 | Permanent<br>Executive<br>(Existing)                                   |
| Senior GIS<br>Developer/ Data<br>processing &<br>Quality Checking       | 01        | 05        | MSc/ M5 (GIS)                                            | 15 years              | GIS Data Development<br>Preferably in Pipeline<br>Network, Advance GIS<br>Data development Skills | Permanent Staff<br>(Existing)/<br>Contract<br>Executives<br>(Required) |
| GIS Developer/<br>Data Development<br>& data integration                | 0         | 06        | MSc/ BS Hons.<br>(GIS)                                   | 03 years              | GIS Data Development<br>Preferably Pipeline<br>Network, Advance GIS<br>Skills                     | Contract<br>Executives<br>(Required)                                   |
| Junior GIS<br>Developer/ Data<br>Development/ GPS<br>Surveying          | 0         | 18        | MSc (GIS)                                                | 01 year               | GIS Data Development<br>Preferably Pipeline<br>Network, Basic GIS skills                          | Contract<br>Executives<br>(Required)                                   |
| GIS Application<br>Developer/ Web<br>Application & Tools<br>Development | 0         | 01        | BS (Computer<br>Science)                                 | 03 year               | Basic GIS Skills and<br>Application<br>Development                                                | Contract<br>Executives<br>(Required)                                   |
| GIS Proposal Maps<br>Developer/<br>Scanning, Record<br>management       | 01        | -         | Diploma in<br>Drafting/ BS (GIS/<br>Computer<br>Science) | 01 Year               | Basic GIS Data<br>Development Skills                                                              | Contract Staff<br>(Existing)                                           |
| <b>Total</b>                                                            | <b>06</b> | <b>30</b> |                                                          |                       |                                                                                                   |                                                                        |

#### JUSTIFICATION

Total Number of Paper Maps (Approx.) = 6700 (UFG-Volume wise First 62 SMS clusters: 113 SMSs)  
 Time consumed By 01 Human Resource to Digitize 01 Map (Avg.) = 04 Days (4" & above network)  
 6700 Paper Maps by 30 Human Resources = 03 Years

#### EMPLOYMENT STATUS OF HUMAN RESOURCE

All GIS Professionals will be hired on Special Project Based Contract basis (extendable as per future needs), initially for a period of 03 years, after Completion of GIS mapping for 62 SMS clusters (4" & above network), hired human resources will be distributed among Head office and all Regional offices to initiate next phase of GIS mapping (up to 1" diameter network digitization along with digitization of downstream network of remaining 15% SMS clusters). They will also responsible for user training for GIS implementation and future GIS development tasks at their respective posting locations. After 03 years these well trained GIS Professionals may gradually be absorbed in SNGPI's Executive cadre as Permanent employees for each Regional Office as well as Head Office (subject to availability of vacancies and HR Policy).

#### EXISTING RESOURCES FROM REGIONAL OFFICES

Existing human resources from Regional offices will be involved in the project for paper maps scanning and GPS surveying of Valves, DRS and TRS. Scanners and GPS devices are already provided to all Regional Offices. Regional staff will also verify the digitized pipeline network layout & connectivity.

**Budgetary Estimates of Phase - I****Phase - I A : 4" to 24" dia Network**

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| A- Human Resource Cost |                                                                     |                    |
|------------------------|---------------------------------------------------------------------|--------------------|
| S.No.                  | Item                                                                | Cost (Rs. Million) |
| 1                      | 01 month Salary of 18 Junior GIS Developers @ Rs.0.05 Million/month | 0.9                |
| 2                      | 01 month Salary of 06 GIS Developers @ Rs. 0.0725 Million           | 0.435              |
| 3                      | 01 month Salary of 05 Senior GIS Developers @ Rs. 0.0875 Million    | 0.4375             |
| 4                      | 01 month Salary of 01 GIS Application Developer                     | 0.08               |
| 5                      | Year 01 Total Salary (12 months) (1+2+3+4)                          | 22.23              |
| 6                      | Year 02 Total Salary (Year 01 X 10%)                                | 24.453             |
| 7                      | Year 03 Total Salary (Year 02 X 10%)                                | 26.8983            |
| 8                      | Total 36 months salary (5+6+7)                                      | 73.58              |

| B- Space Rental/Utility Estimates |                                                                     |                    |
|-----------------------------------|---------------------------------------------------------------------|--------------------|
| S.No.                             | Item                                                                | Cost (Rs. Million) |
| 1                                 | 01 month Space Rental for 3000 Sq.ft @ Rs. 0.00012 Million/Sq.ft    | 0.36               |
| 2                                 | 01 month Utility Expense for 3000 Sq.Ft @ Rs. 0.00005 Million/Sq.ft | 0.15               |
| 3                                 | 01 month total Expenses (1+2)                                       | 0.51               |
| 4                                 | 36 months Total Expenses (3X36)                                     | 18.36              |

| C- Furniture Equipment Estimate |                                                                |                    |
|---------------------------------|----------------------------------------------------------------|--------------------|
| S. No.                          | Item                                                           | Cost (Rs. Million) |
| 1                               | 30 Workstation Tables with Ergonomic Chairs @ Rs. 0.06 million | 1.8                |
| 2                               | 02 Executive Tables with Cabinets @ Rs. 0.19 Million           | 0.38               |
| 3                               | 05 Visitor chairs @ Rs. 0.036 Million                          | 0.18               |
| 4                               | 01 Conference Table                                            | 0.05               |
| 5                               | Total Furniture Cost (1+2+3+4)                                 | 2.31               |

| D- IT Infrastructure |                                                           |                    |
|----------------------|-----------------------------------------------------------|--------------------|
| S.No.                | Item                                                      | Cost (Rs. Million) |
| 1                    | 30 x 12" Desktop/Workstation Computer @ Rs. 0.325 Million | 10.4               |
| 2                    | 01 Network Switch and Allied Equipment                    | 0.55               |
| 3                    | 30 x 2" UPS for Computers @ Rs. 0.03 Million              | 0.96               |
| 4                    | 05 Portable Hard Drives (4TB Each) @ Rs. 0.03 Million     | 0.18               |
| 5                    | 01 A3 B&W Printer                                         | 0.5                |
| 6                    | Total Infrastructure Expense (1+2+3+4+5)                  | 12.59              |

= 2 Workstations Required for Database management

| E- Miscellaneous Items |                                                         |                    |
|------------------------|---------------------------------------------------------|--------------------|
| S.No.                  | Item                                                    | Cost (Rs. Million) |
| 1                      | 42/44 Inches Color Plotter (01)                         | 1                  |
| 2                      | Stationery & Paper (A4/A4, 42/44 Inches Paper Rolls)    | 0.7                |
| 3                      | Pedestal Fans (08) @ Rs. 0.01 Million                   | 0.08               |
| 4                      | Paper Shredder (02) @ Rs. 0.05 Million                  | 0.1                |
| 5                      | High Resolution Satellite imagery (150000 Sq. Km)       | 75                 |
| 6                      | Vehicle for survey/official visits (02) @ Rs. 9 Million | 18                 |
| 7                      | THA/Fuel/ Vehicle Maintenance Cost                      | 12                 |
| 8                      | Total Miscellaneous Expense (1+2+3+4+5+6+7)             | 106.88             |

|                                   |        |
|-----------------------------------|--------|
| Total Phase I -A Cost (A+B+C+D+E) | 213.73 |
|-----------------------------------|--------|

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**Phase - I B : 1" to 3" dig Network**

**A- Human Resource Cost**

| S.No. | Item                             | Cost (Rs. Million) |
|-------|----------------------------------|--------------------|
| 1     | Year 01 Total Salary             |                    |
| 2     | Year 02 Total Salary (2 X 10%)   | 29.59              |
| 3     | Year 03 Total Salary (3 X 10%)   | 32.54              |
| 4     | Year 04 Total Salary (4 X 10%)   | 35.8               |
| 5     | Total 48 months salary (1+2+3+4) | 39.39              |
|       |                                  | 137.32             |

**B- Space Rental/Utility Estimates**

| S. No. | Item                                                                | Cost (Rs. Million) |
|--------|---------------------------------------------------------------------|--------------------|
| 1      | 01 month Space Rental for 3000 Sq.ft @ Rs. 0.00012 Million/Sq.ft    | 0.36               |
| 2      | 01 month Utility Expense for 3000 Sq.ft @ Rs. 0.00005 Million/Sq.ft | 0.15               |
| 3      | 01 month total Expenses (1+2)                                       | 0.51               |
| 4      | 48 months Total Expenses (3X48)                                     | 24.48              |

**C- Miscellaneous Items**

| S.No. | Item                                                 | Cost (Rs. Million) |
|-------|------------------------------------------------------|--------------------|
| 1     | Stationery & Paper (A3/A4, 42/44 Inches Paper Rolls) | 1                  |
| 2     | Total Miscellaneous Expense                          | 1                  |

|                                     |              |
|-------------------------------------|--------------|
| <b>Total Phase 1-B Cost (A+B+C)</b> | <b>162.8</b> |
|-------------------------------------|--------------|

|                                     |               |
|-------------------------------------|---------------|
| <b>Total Phase 1 Cost (1A + 1B)</b> | <b>376.52</b> |
|-------------------------------------|---------------|

**Budgetary Estimates of Phase -2**

Phase -2 (1" to 24" dia Network)

| A- Human Resource Cost |                                 |                    |
|------------------------|---------------------------------|--------------------|
| S.No.                  | Item                            | Cost (Rs. Million) |
| 1                      | Year 01 Total Salary            | 43.32              |
| 2                      | Year 02 Total Salary (1 X 10%)  | 47.55              |
| 3                      | Year 3-5 Total Salary (2 X 10%) | 36.21              |
| 4                      | Total 30 months salary (1+2+3)  | 117.18             |

| B- Space Rental/Utility Estimates |                                                                       |                    |
|-----------------------------------|-----------------------------------------------------------------------|--------------------|
| S.No.                             | Item                                                                  | Cost (Rs. Million) |
| 1                                 | 01 month Space Rental for 3000 Sq. ft @ Rs. 0.00012 Million/Sq. ft    | 0.36               |
| 2                                 | 01 month Utility Expense for 3000 Sq. ft @ Rs. 0.00005 Million/Sq. ft | 0.15               |
| 3                                 | 01 month total Expenses (1+2)                                         | 0.51               |
| 4                                 | 30 months Total Expenses (3X30)                                       | 15.3               |

| C- Miscellaneous Items |                                                       |                    |
|------------------------|-------------------------------------------------------|--------------------|
| S.No.                  | Item                                                  | Cost (Rs. Million) |
| 1                      | Stationery & Paper (A3/A4 ; 42/44 inches Paper Rolls) | 0.5                |
| 2                      | Total Infrastructure Expense                          | 0.5                |

|                            |        |
|----------------------------|--------|
| Total Phase 2 Cost (A+B+C) | 132.98 |
|----------------------------|--------|



# SUI NORTHERN GAS PIPELINES LIMITED

Ref: P&D/02-14257

Date: 12.09.2020

The Surveyor General of Pakistan,  
Fazlabad - Murree Road,  
Rawalpindi.

## GIS MAPPING OF SNGPL'S GAS PIPELINE NETWORK

Dear Sir,

SNGPL is the largest natural gas utility Company of the country engaged in supply of natural gas to its consumers at their door step located in its franchise area i.e. Punjab, KPK and AJK.

SNGPL is working on their GIS mapping project to digitize all of their Pipelines Network up to House-level, for effective Pipeline management, planning and rehabilitation using Enterprise GIS solution. SNGPL's pipeline network is composed of approx. 135,857 Km of gas distribution pipeline network and 9,106 Km of transmission pipeline network. So far we have completed our transmission pipeline network mapping and successfully implemented it through Enterprise GIS solution using our in-house resources and expertise. Our distribution pipeline network comprising approx. 9300 number of distribution layout maps (DLMs) sprawling over its franchise area. Keeping in view the quantum of work in hand, large resources are required for its earliest completion, therefore, SNGPL would like to explore the possibility of using support for the digitization of aforementioned distribution layout maps for its completion in the most earliest time.

In this connection, it has been learnt that Survey of Pakistan has also expertise in digitization of maps and some digitized gas pipeline network is also available with them which may please be shared with us for checking its utilization in our operational functions. Moreover, please arrange to provide us a detailed proposal about Survey of Pakistan's services for the subject matter covering the total cost and minimum possible time line for the completion of tasks as per following work scope:

1. Scanning & Geo-referencing of 9300 No. DLMs paper maps, with proper naming convention for all 16 gas distribution regions of SNGPL covering cities and localities of its franchise area.
2. Provision of seamless & cloud free high resolution satellite imagery (0.5 / 0.3 Meters and not older than six months) to be used as a base map for geo-referenced paper maps & digitized pipeline network covering the cities and localities of its franchise area.
3. Digitization of distribution pipeline network maps up to house level on 1:1000 scale (including pipeline network, road network up to street level, land parcels and locations) along with their associated attributes.
4. Attributes entry / integration with digitized distribution pipeline network including but not limited to pipeline attributes (diameter, aging, pipeline name, from-to, pressure etc.), SMS (above ground metering station) / TBS & DRS (above ground regulation stations) attributes (name, location, size, fitting information, inlet / outlet pressure, date of commissioning / installation, off take information), fittings attributes i.e. valves, reducers and tees (name, location, size, location i.e. over head or underground, flow information etc.) and CP station attributes.

Telephone: 02-42201332

Telefax: 02-42201378

Mobile: 99-99201332

Contd...





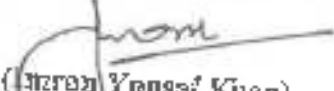
SUI NORTHERN GAS PIPELINES LIMITED

5. Implementation of internationally recognized Utility Pipeline Data Model (UPDM) for Pipeline network digitization (enabling us to integrate GIS map with our existing Gas modeling/analysis software).
6. Geometric network development on digitized pipeline network for utility network analysis (flow modeling and connected / disconnected analysis).

In case of any clarification or some meeting is desired to discuss the matter, please feel free to contact us.  
Looking forward to having your response at the most earliest.

Regards,

Yours faithfully,  
SUI NORTHERN GAS PIPELINES LIMITED

  
(Imran Yousaf Khan)  
General Manager (P&D)  
For Managing Director

email: imran.yousaf@sngpl.com.pk  
Tel: 942-99201376





ANNEXURE 24  
GM (P&D)  
29 OCT 2020  
22475  
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GOVERNMENT OF PAKISTAN  
Ministry of Defence  
Survey of Pakistan  
Directorate Eastern Circle  
Plot No. 50, Imtiaz Shaheed Road, Near  
C.M.H., Lahore Cantt.  
Tele : 042-99223151 Fax: 042-99223152  
No. 3566 /40-Q-Survey SNGPL  
Dated: 28-10-2020.

To

The General Manager (P&D),  
Sui Northern Gas Pipeline Limited,  
Lahore.

Info:

Deputy Surveyor General-I, Survey of Pakistan, Rawalpindi.

Sub:

**GIS MAPPING OF SNGPL's GAS PIPELINE NETWORK:**

Ref:-

SNGPL's letter No. P&D/02-14257, dated 02.09.2020.

Find enclosed herewith estimated cost of GIS Mapping of SNGPL's Gas Pipeline Network amounting to Rs. 1,412,082,000/- (Rupees 1412.082 Million only) duly approved by the competent authority. The cost estimates are prepared on No Profit No Loss basis being a Federal Govt. department.

2. The project will be taken up as per priority list (Region wise), which will be provided by SNGPL to execute the project ToR/MoU will be discussed/shared between technical teams of SOP & SNGPL for execution of the project.
3. Detail break up of project activities and cost are attached as desired for information and necessary action.

  
NADEEM AHMAD CH.  
Director Eastern Circle  
Survey of Pakistan, Lahore

00000128

### SCOPE OF WORK

it. Area to be surveyed in phase

THE NO. OF SHEETS OF THIS 12000

Dr. M. S. D. L. Mapa

## SUMMARY OF TECHNICAL WORK

## FIELD WORK:

- i. Provision of GPS Control for Geo-Referencing of Satellite Image & DTM-Maps
- ii. Provision of GPS Control for provision of coordinates for SMS, TSS, DRS & valves
- iii. Field Verification of selected

**OFFICE WORK:**

- i. Procurement of Satellite Imagery (0.5 M) of an area of 120000 sq.km
- ii. Scanning of DL Maps
- iii. Geo Rectrancing of DL Maps & Images
- iv. GIS Mapping & Preparation of Attribute Data on Scale 1:2000
- v. Updation/Inscription of field collected data on scale 1:2,000 after Field Verification
- vi. Cost of reproduction / printing on scale 1:2000

**CONTINGENT EXPENDITURE:**

- i. POL and Repairing charges of Vehicles employed for Gbg Control
- ii. POL and Repaling charges of Vehicles employed for Field verification
- iii. Stationary Charges for office & field work for 40000 sheets
- iv. Shifting of Storero / instrument & equipment etc. for field work
- v. Others Miscellaneous (Data storage, software / hardware for PCs etc.

**GOVT. FEE:** (Supervision / Over head Charges / Deposit work Allowance etc.

120000 sq.km

Washburn County

4000 Shear

\$700 sheets/DL-113476

| Cost                                |                          |
|-------------------------------------|--------------------------|
| 27000 Points                        | Rs. 15,535,554           |
| 25000 Points                        | Rs. 14,797,801           |
| 8000 sheets                         | Rs. 155,257,167          |
| 6700 DL-Maps                        | Rs. 420,000,000          |
| 6700 DL-Maps                        | Rs. 244,433              |
| 40000 sheets                        | Rs. 1,389,485            |
| 8000 sheets                         | Rs. 340,520,759          |
| 40000 sheets                        | Rs. 27,888,679           |
| 10 Nos. Vehicles                    | Rs. 60,000,000           |
| 10 Nos. Vehicles                    | Rs. 4,800,000            |
|                                     | Rs. 14,938,000           |
|                                     | Rs. 2,000,000            |
|                                     | Rs. 1,500,000            |
|                                     | Rs. 2,500,000            |
|                                     | Rs. 321,641,349          |
| <b>GRAND TOTAL:</b>                 | <b>Rs. 1,412,081,925</b> |
| <b>SAY TOTAL (IN ROUND FIGURES)</b> | <b>Rs. 1,412,082,000</b> |

(Rupees 1412.082 Million only)

(Rupees 442.082 million only)

# BUDGET ESTIMATE

## PHASE-1A

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Annex - E

### 1- Capital Items

| Sr. No. | Description                                                                             | Cost (Rs. Million) |
|---------|-----------------------------------------------------------------------------------------|--------------------|
| i       | <b>Furniture Equipment</b>                                                              |                    |
|         | 30 Workstation Tables + 02 Executive Tables + 05 Visitor Chairs + 01 Conference Table   | 2.31               |
| ii      | <b>IT Infrastructure</b>                                                                |                    |
|         | 32 Computers + 32 UPS + 01 Network Switch + 06 Portable Hard Drives + 01 Printer        | 12.59              |
| iii     | <b>Miscellaneous</b>                                                                    |                    |
|         | 01 Plotter, 08 Fans, 02 Paper Shredder, Satellite Imagery (150,000 Sq. Km), 02 Vehicles | 94.18              |
|         | <b>Total (i+ii+iii)</b>                                                                 | <b>109.08</b>      |

### 2- Revenue Items

| Sr. No. | Description                             | Cost (Rs. Million) |
|---------|-----------------------------------------|--------------------|
| i       | <b>Human Resource</b>                   |                    |
|         | 36 Month Salary of 30 GIS Professionals | 73.58              |
| ii      | <b>Space Rental/ Utility</b>            |                    |
|         | 36 Month Rent + Utility for 3000 Sq. Ft | 18.36              |
| iii     | <b>Miscellaneous</b>                    |                    |
|         | Stationary, Maintenance                 | 12.70              |
|         | <b>Total (i+ii+iii)</b>                 | <b>104.64</b>      |
|         | <b>Phase-1A : Total Cost 1 + 2</b>      | <b>213.72</b>      |

## PHASE-1B

### 1- Capital Items

There is no capital cost involved.

### 2- Revenue Items

| Sr. No. | Description                             | Cost (Rs. Million) |
|---------|-----------------------------------------|--------------------|
| i       | <b>Human Resource</b>                   |                    |
|         | 48 Month Salary of 30 GIS Professionals | 137.32             |
| ii      | <b>Space Rental/ Utility</b>            |                    |
|         | 48 Month Rent + Utility for 3000 Sq. Ft | 24.48              |
| iii     | <b>Miscellaneous</b>                    |                    |
|         | Stationary                              | 01                 |
|         | <b>Total (i+ii+iii)</b>                 | <b>162.8</b>       |
|         | <b>Phase-1B : Total Cost</b>            | <b>162.8</b>       |

**Grand Total (Phase-1A + Phase-1B) (Rs. Million) = 376.52**

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**PHASE-2****1- Capital Items**

There is no capital cost involved.

**2- Revenue Items**

| Sr. No. | Description                             | Cost (Rs. Million) |
|---------|-----------------------------------------|--------------------|
| i       | <b>Human Resource</b>                   |                    |
|         | 30 Month Salary of 30 GIS Professionals | 117.18             |
| ii      | <b>Space Rental/ Utility</b>            |                    |
|         | 30 Month Rent + Utility for 3000 Sq.Ft  | 15.3               |
| iii     | <b>Miscellaneous</b>                    |                    |
|         | Stationary                              | 0.5                |
|         | <b>Total (i+ii+iii)</b>                 | 132.98             |

**Grand Total (Phase-1 + Phase-2) (Rs. Million) = 509.50**



A-3  
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# SUI NORTHERN GAS PIPELINES LIMITED

## MEMORANDUM

|                                      |                          |
|--------------------------------------|--------------------------|
| From: Company Secretary              | To: SGM-D (N)/ SGM -D(S) |
| Ref. CA/BOD-1/S164 February 18, 2021 | Thru: DMD (OPS)          |

### ITEM-L INSTALLATION OF SMART METERING AT ISOLATED TBSs, WHICH ARE CURRENTLY WITHOUT METERS

**CONFIDENTIAL**

#### (SHORT ORDER)

This is with reference to your letter no.SGMD:113/22/CS/1757 dated 15/02/2021 on the captioned subject. In this respect revised short order after making necessary correction as requested, is being issued as under.

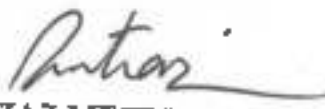
The Board of Directors considered this agenda item at its 566<sup>th</sup> meeting held on February 13, 2021.

After detailed deliberation, the Board of Directors in line with the recommendation of the Finance and Procurement Committee given at its 316<sup>th</sup> meeting held on February 12, 2021 accorded approval for the following subject to completion of all relevant codal / procedural, legal and financial pre-requisites:

- (i) Rs. 3,345 Millions for FY 2021-22 for installation of Smart Metering.
- (ii) Intimation of revised total amount pertaining to this activity to OGRA for considering it as part of ERR FY 2021-22.
- (iii) In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, the Management was allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.

The Managing Director was authorized to take or cause to be taken all the necessary steps to give effect to the above decision.

You are requested to please take further action in this regard. The detailed minutes are under preparation and would be communicated after clearance by the Chairperson, Board of Directors.

  
(IMTIAZ MEHMOOD)  
Company Secretary

cc: MD  
cc: CFO

*Ind*

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**SUI NORTHERN GAS PIPELINES LIMITED****AGENDA FOR FINANCE & PROCUREMENT COMMITTEE MEETING**

ITEM " "

Note to Directors.

From: Managing Director

Note No. :

Dated: 28-01-2021

**INSTALLATION OF SMART METERING AT ISOLATED TBSs, WHICH ARE CURRENTLY WITHOUT METERS****1. MANAGEMENT REQUEST**

Considering and recommending to SOD for allowing amount for installation of Smart Metering (i.e. remote communication system) at 2,924 isolated TBSs, which are currently without meters, in compliance of directions of RM&UPGCC of SOD, given in its 43<sup>rd</sup> meeting held on 21.01.2021.

**2. FINANCIAL INFORMATION**

An amount of Rs. 3,345 Millions will be required, which will be obtained from OGRA through Estimated Revenue Requirement (ERR) FY 2021-22, under the capital budget.

**3. BRIEF CHRONOLOGICAL HISTORY**

There are 5,678 TBSs/DRSs at our distribution network, which are categorized as follows:

| Description |                                    | Cases (No) |
|-------------|------------------------------------|------------|
| Isolated    | Metered*                           | 822        |
|             | Which are currently without Meters | 2,924      |
|             | Sub Total                          | 3,746      |
| Looped      |                                    | 1,932      |

\*In the past, meters were installed at certain TBSs/DRSs for monitoring of different operating parameters, such as pressure and flow.

In compliance with direction of RM&UPGCC given in its different meetings, the company was pursuing following work plan for phase wise execution of planned activities:

**1st Phase: (32 Isolated and Metered TBSs, selected as Pilot Project):**

- TBS to Consumers Mapping in system (already completed on October, 2020).
- Updating GPS coordinates of TBSs in system (already completed on 15.12.2020)
- Monthly gas reconciliation of selected as Pilot Project w.e.f. Sep. 2020
- UFG Control activities for reducing UFG against TBSs selected as Pilot Project started w.e.f. Oct. 2020

00000133

**2nd Phase:** (Comprising of remaining 790 Isolated and Metered TBSs);

- TBS to Consumers Mapping in system (already completed on 15.12.2020)
- Updating GPS coordinates of TBSs in system (already completed on 15.12.2020)
- Replacement of 377 defective meters from isolated-metered TBSs by 31.01.2021
- Monthly gas reconciliation of all 790 metered TBSs w.e.f. March, 2021

**3rd Phase:** (Comprising of 2,924 Isolated TBSs, where currently meters are not installed)

- TBS to Consumers Mapping in system (target date is 31.01.2021)
- Updating GPS coordinates of TBSs in system (target date is 31.01.2021)

At present, meters are not installed at 2,924 isolated TBSs. Company had planned phase wise installation of smart metering at these isolated TBSs. Accordingly, OGRA was requested through petition for Estimated Revenue Requirement (ERR) FY 2021-22 in December, 2020 to allow Rs. 920 Millions in the 1st tranche, which was to be followed by remaining.

As per advice of RM & UFGCC the company will also consider de-looping/segmentation of looped TBSs, for which detailed study will be required and initially, two looped TBS clusters from two different Regions are being selected.

**4. BUDGET INFORMATION / IMPACT ON REVENUE OF COMPANY**

The required amount of Rs. 3,345 Millions will be obtained from OGRA and company will be enabled to get Return on Asset (ROA).

**5. RISK INVOLVED / MITIGATION STRATEGY:**

- The impact in the shape of UFG reduction will not be pronounced w.r.t. cost benefit analysis. That was the reason TBS reconciliation was not part of our earlier two UFG reduction plans since same was not considered proportionately advantageous due to cost-benefit analysis and operational constraints in meter string and propensity of meter damages due to wide variation in the pressures because of supply demand gap. The RM&UFGCC, however observed that through TBS reconciliation, system visibility will be increased to pin point losses for subsequent reduction and facilitate ease of network operations.
- UGRA may completely disallow or partially allow the requested budget. The situation will become lucid after decision of ERR 2021-22, which is expected in May/June, 2021.
- The activity involves procurement of imported items such as meters, EVCs, GPRS systems, valves, flanges, filter strainer etc. and each item has its own lead time for delivery. COVID-19 situation has adversely affected our supply chain in the past.
- Site work involves modification of existing TBSs/DRSs, which is cumbersome task as TBSs/DRSs are installed at congested locations/along busy roads etc. Moreover, land acquisition may also be required at certain locations.

Serial No. (ii) and (iv) will be mitigated through planning, while serial No. (i) is the discretion of OGRA. However, company will actively pursue the matter with OGRA.

#### 6. CONFORMANCE TO RULES/LAWS:

The Management confirms that transaction is as per policy and conforms to all legal/codal/financial requirements in place.

#### 7. RECOMMENDATIONS:

In compliance with directions of RM&UEGOC, given in its 43rd meeting held on 21.01.2021, Smart Metering will be installed at estimated cost of Rs. 3,345 Millions as follows:

- Rs. 3,184 Millions for installation of smart metering at 2,924 Isolated TBSs, which are currently without meters. Breakup is as under:

|                                                |   |                     |
|------------------------------------------------|---|---------------------|
| Meters, EVCs & GPRS etc.                       | = | 2,228 Millions      |
| Allied material (Valves, Flanges, Elbows etc.) | = | 360 Millions        |
| Construction Cost etc.                         | = | 187 Millions        |
| <u>Land Acquisition</u>                        | = | <u>439 Millions</u> |
| Total                                          | = | 3,184 Millions      |

- Rs. 151 Millions for installation of GPRS system at 615 Metered TBSs.

In this regard, the Management recommends to F&PC to consider and recommend to Board of Directors for allowing:

- Rs. 3,345 Millions for FY 2020-21 for installation of Smart Metering, as stated above.
- Intimation of revised total amount pertaining to this activity to OGRA for considering it as part of ERR FY 2021-22.
- In view of the fact that the breakup of the total project cost in different heads/components is tentative in nature, Management may be allowed to reallocate the budget within different heads (if required) keeping overall expenditure within the total proposed project cost.

  
(QAISER NASOOD)  
SR. GENERAL MANAGER (D-S)

  
(SAQIB ARSHAD)  
SR. GENERAL MANAGER (D-N)

  
(FAISAL IQBAL)  
CHIEF FINANCIAL OFFICER

  
(SOHAIL M. GULZAR)  
DY. MANAGING DIRECTOR (OPS)

  
(ALI S. HASHDANI)  
MANAGING DIRECTOR



# SUI NORTHERN GAS PIPELINES LIMITED

GAS HOUSE, 21 KASHMIR ROAD, P.O. BOX 56, LAHORE (PAKISTAN)

Ref: RA-MISC-004-21

Date: March 01, 2021

Registrar,  
Oil & Gas Regulatory Authority,  
Plot # 54, ZIT Plaza, Faisal-e-Maq Road,  
Near PIA Building, Blue Area,  
Islamabad.

*Thru: Courier*

Subject: GENERAL POWER OF ATTORNEY

Dear Sir,

With reference to the above captioned subject. In this regard, it is submitted that Sui Northern Gas Pipeline Limited is pleased to authorize the undersigned through a registered General Power of Attorney to represent and act on behalf of the Company before the Oil and Gas Regulatory Authority.

Copy of the Registered General Power of Attorney is enclosed herewith for your information and record please.

Yours Sincerely,  
Sui Northern Gas Pipelines Limited

*A. Qureshi*  
(SYED M. ABDUL GHAFOOR)  
CHIEF OFFICER (RA)  
FOR MANAGING DIRECTOR

Encl as above:



Telephones: Exch: { +92-42(99082041)  
+92-42(99082005)

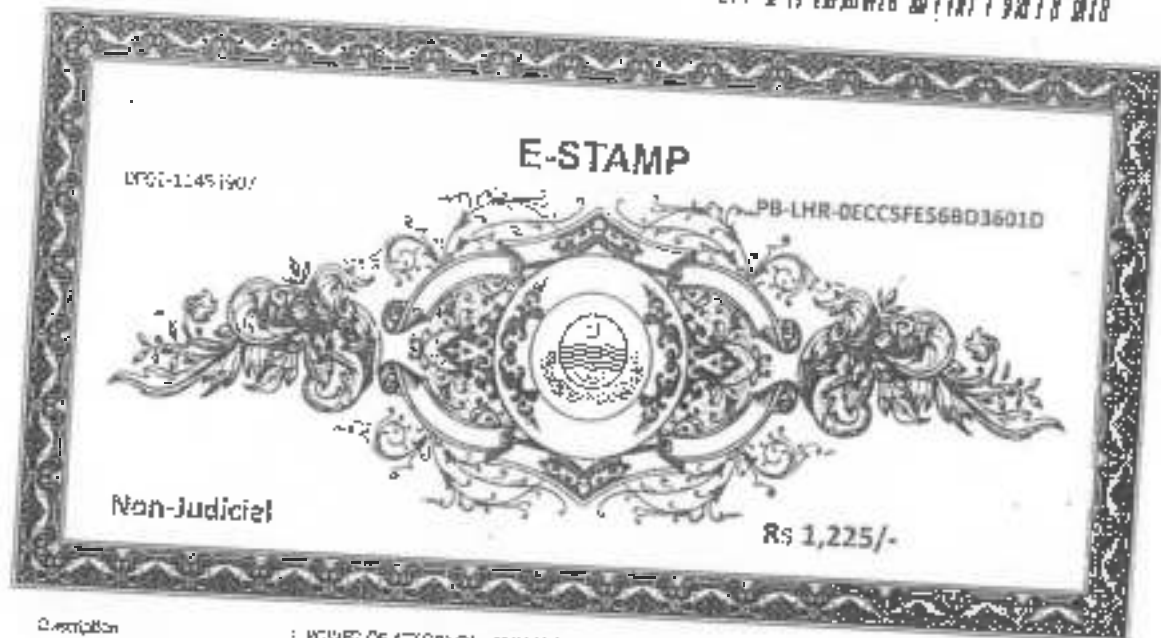
Telephone: { 042 - 99201388

Fax: 042 - 99204824

www.sngpl.com.pk



2014-15-16 1901150

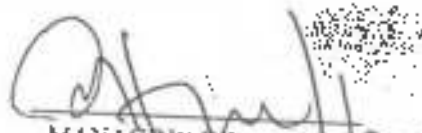


Description : POWER OF ATTORNEY - 42(1)(a)  
 First Party / Principal : Syed Ali Javid Hamdani MD (90403-0107677-7)  
 Second Party / Attorney holder : Syed Muhammad Abdul Ghafoor (35302-2313045-2)  
 Agent : Tahir Hashiq (25302-2728/74-2)  
 Stamp Duty Paid by : Syed Ali Javid Hamdani MD (90403-0107677-7)  
 Issue Date : 25-Jan-2021, 01:26:50 PM  
 Paid Through Cheques : 202100016-010304  
 Amount in Words : One Thousand Two Hundred and Twenty Five Rupees Only

### GENERAL POWER OF ATTORNEY

By this Deed of Attorney given on 13<sup>th</sup> day of Feb, 2021, I Syed Ali Javid Hamdani s/o Mr. Farrukh Ali Hamdani, CNIC No. 90403-0107677-7, Managing Director/Chief Executive of Sui Northern Gas Pipelines Limited, incorporated under the Companies Act, 1913 (now the Companies Act, 2017) and having its registered office at Gas House, 21-Kashmir Road, Lahore (hereinafter referred as "The Company") is authorized to execute this General Power of Attorney in terms of clause 27 of the General Power of Attorney executed in favour of the Managing Director of Sui Northern Gas Pipelines Limited duly registered with the sub-registrar Data Ganj Haksh Town, Lahore, having document No. 43, Book No. 4, Volume No. 311, dated 23.01.2021, to delegate to any person or persons all or any of the powers conferred upon him. Now therefore, the Managing Director, SNGPL hereby appoints Syed Muhammad Abdul Ghafoor, Chief Officer (Regulatory Affairs), to be its true lawful attorney to do or execute all or any acts and things hereinafter mentioned that is to say:

1. To represent the Company in all proceedings before the Oil and Gas Regulatory Authority ("OGRA") and / or other regulatory authorities including Director General (Gas), Ministry of Petroleum & Natural Resources, Government of Pakistan.
2. To file and appear in proceedings, sign application, petitions and other documents that may be required to defend the Company petition(s) for its revenue requirement, tariff, licensing and any other ancillary matters.
3. To sign and file interventions, requests, comments, affidavits, furnish undertakings and for any other documents that may be required in any matter before OGRA.

  
 MANAGING DIRECTOR  
 CNIC No. 90403-0107677-7





E-STAMP  
CONTINUATION SHEET

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4. To appoint Advocates and give them due authority to act and conduct the cases and appear in all proceedings to defend the Company before OGRA and / or any other regulatory authority including Director General (Gas); Ministry of Petroleum & Natural Resources, Government of Pakistan.

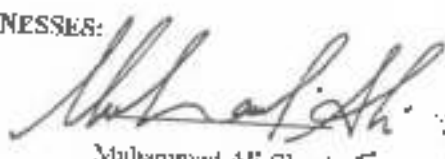
All legal acts done by the said attorneys in furtherance of the Company proceedings before OGRA, before execution of this power of Attorney, are hereby ratified and deemed to have been done under lawful authority.

IN WITNESS WHEREOF the common Seal of the Company was hereunto affixed on the 13<sup>th</sup> day of Feb, 2021 at Lahore.

  
MANAGING DIRECTOR  
CNIC No. 90403-0107677-7

The common seal of  
Sui Northern Gas Pipelines Limited  
was hereunto affixed in the Presence of:

WITNESSES:

  
Muhammad Ali Chughtai  
Senior Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 35202-6800371-1

  
Mr. Usman Abbasi  
Law Officer  
Sui Northern Gas Pipelines Limited  
21-Kashmir Road, Lahore.  
CNIC No. 35202-6800371-1



OGRA-6(2)-10/2021

March 4, 2021

The Managing Director,  
Sui Northern Gas Pipelines Limited,  
21-Kashmir Road,  
**LAHORE.**

**Subject: GENERAL POWER OF ATTORNEY**

Dear Sir,

Please refer to your office letter No. RA-MISC-004-21 March 1, 2021 on the subject noted above.

2. It is to inform that the Authority during a Revenue Requirement hearing held at OGRA Office, Islamabad in May, 2020 strictly advised SNGPL to submit General Power of Attorney authorizing an officer not less than the designation of Chief Financial Officer for filing a petition before the Authority for determination of its Revenue Requirement who is well conversant about the facts of the whole petition. In response thereto, SNGPL vide its letter dated 28-07-2021 (F/A) authorized CFO through a registered General Power of Attorney to represent and act on behalf of the SNGPL before Oil and Gas Regulatory Authority.
3. Now, SNGPL vide its letter No. RA-MISC-001-21 dated 01-03-2021 submitted a General Power of Attorney authorizing Chief Officer (RA) to represent the company in all proceedings before the Authority which does not merit the advice communicated by the Authority.
4. In view of the foregoing, it is advised to submit General Power of Attorney by authorizing an officer not less than the designation of CFO after soliciting approval from the Board of Directors of SNGPL, in order to represent the company before the Authority. Further, a Power of Attorney approved by Board of Directors of SNGPL in the name of newly appointed Managing Director may also be submitted (F/B), please.

Best Regards,

(Dr. Abdul Basit Qureshi)  
Registrar

(For & on behalf of the Authority)



1234567

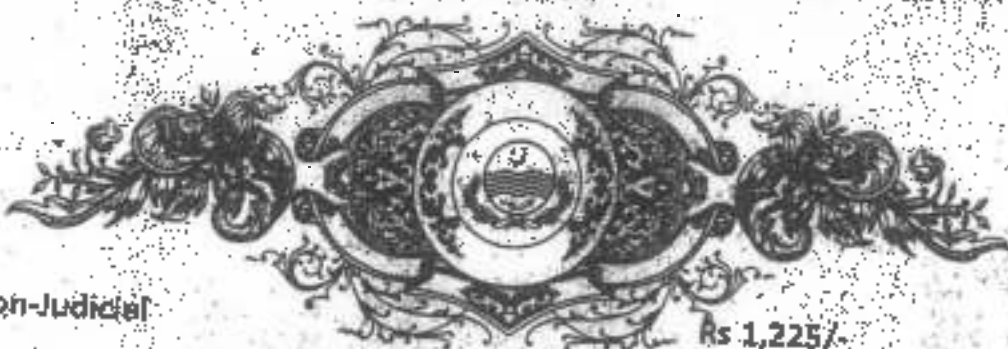
OFFICE OF THE ATTORNEY GENERAL

26  
F/A

35202-2182023-0

E-STAMP

PB-DHR-7914E70735P9819A



Non-Judicial

Rs 1,225/-

|                      |                                                      |
|----------------------|------------------------------------------------------|
| Principal            | SNPA, through Asst. Tufail [35202-2182023-0]         |
| Attorney / Principal | Salim Iqbal [35202-1648388-5]                        |
| Attorney / Attorney  | Talib Murtaza [35202-2736774-5]                      |
| Agent                | SNPA, through Asst. Tufail [35202-2182023-0]         |
| Stamp Duty Paid by   | 19-Feb-2020, 09:15:44 PM                             |
| State Code           | 2320PCCAD2C5-0A8D                                    |
| File Through Challen |                                                      |
| Amount in Words      | One Thousand Two Hundred and Twenty Five Rupees Only |

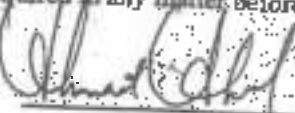
Power of Attorney

**GENERAL POWER OF ATTORNEY**

By this Deed of Attorney given on 10<sup>th</sup> day of July, 2020, I Mr. Amer Tufail s/o Sardar Muhammad Tufail Khan, CNIC No. 35202-2182023-0, Managing Director and Chief Executive of Sui Northern Gas Pipelines Limited, incorporated under the Companies Act, 1913 (now the Companies Act, 2017) and having its registered office at Gas House, 21-Kashmir Road, Lahore alongwith another Director (hereinafter referred as "The Company") are authorized to execute this General Power of Attorney in terms of clause 27 of the General Power of Attorney executed in favour of the Managing Director of Sui Northern Gas Pipelines Limited, to delegate to any person or persons all or any of the powers conferred upon him. Now therefore, the Company hereby appoints Mr. Farooqulhaq, Chief Financial Officer, to be its true lawful attorney to do or execute all or any acts and things hereinafter mentioned that is to say:

1. To represent the Company in all proceedings before the Oil and Gas Regulatory Authority ("OGRA") and / or other regulatory authorities including Director General (Gas), Ministry of Petroleum & Natural Resources, Government of Pakistan.
2. To file and appear in proceedings, sign application, petitions and other documents that may be required to defend the Company petitions(s) for its revenue requirement, tariff, licensing and any other ancillary matters.
3. To sign and file interventions, requests, comments, affidavits, furnish undertakings and / or any other documents that may be required in any matter before OGRA.

  
MANAGING DIRECTOR  
CNIC No.

  
DIRECTOR  
CNIC No.





# SUI NORTHERN GAS PIPELINES LIMITED

**CERTIFIED TRUE COPY OF RESOLUTION PASSED**  
**AT THE 516<sup>TH</sup> MEETING OF THE BOARD OF DIRECTORS**  
**HELD ON THURSDAY, JANUARY 10, 2019**

## **IT IS HEREBY RESOLVED**

**THAT** the resignation of Mr. Amjad Latif as Managing Director be and is hereby accepted with effect from January 10, 2019 (A.N).

**THAT** Mr. Amer Tufail, Deputy Managing Director (Services) is hereby assigned the charge of the Managing Director of Sui Northern Gas Pipelines Limited, being the most senior official of the Company with effect from January 10, 2019 for a period of 90 days or till the appointment of a regular Managing Director whichever is earlier.

**THAT** Mr. Amer Tufail is hereby authorized to sign and approve all documents which normally require the Managing Director's approval.

**THAT** any two Directors be and are hereby authorized to sign the General Power of Attorney in favour of Mr. Amer Tufail on behalf of the Company, under the seal of the Company.

**THAT** the power of attorney executed in favour of Mr. Amjad Latif is hereby revoked.



## PUBLIC NOTICE

### Petition Filed by Sui Northern Gas Pipelines Limited for Determination of its Estimated Revenue Requirement / Prescribed Prices for F.Y. 2021-22

Sui Northern Gas Pipelines Limited (the Petitioner) filed a petition before the Authority on December 31, 2020 under Section 8 (1) of the Oil and Gas Regulatory Authority Ordinance, 2002, read with Rule 4 (2) of the Natural Gas Tariff Rules, 2002, for Determination of its Estimated Revenue Requirements / prescribed prices for FY 2021-22. Subsequently, the Petitioner filed a revised petition for Determination of its Estimated Revenue Requirements / prescribed prices for FY 2021-22 on March 1, 2021. The Petitioner has projected an increase of Rs.1,415.91 per MMBTU including previous years' shortfall Rs.669.75 per MMBTU for F.Y. 2021-22 in normal business. Cost of RLNG diverted towards domestic sector has also been claimed at Rs.27,940 million as part of cost of gas.

The breakup of projected prescribed price in respect of natural gas is provided below:

| PARTICULARS                                   | The Estimates for F.Y. 2021-22 as per the Petition |                             |                                    |
|-----------------------------------------------|----------------------------------------------------|-----------------------------|------------------------------------|
|                                               | Transmission                                       | Transmission & Distribution | Transmission, Distribution & Sales |
|                                               | Rs. in Million                                     |                             |                                    |
| Sales Volume (MMBTU)                          | -                                                  | -                           | 379,409                            |
| Cost of Gas                                   | -                                                  | -                           | 191,172                            |
| Operating Cost                                | 6,558                                              | 15,754                      | 81,427                             |
| Depreciation                                  | 5,205                                              | 24,502                      | 24,873                             |
| Return on Assets                              | 2,962                                              | 26,151                      | 25,212                             |
| Subsidy for LPG-Air-Mix Projects              | -                                                  | 167                         | 167                                |
| UFG Adjustment                                | -                                                  | -                           | (750)                              |
| Other Operating Income                        | (280)                                              | (3,660)                     | (19,002)                           |
| <b>Total Revenue Requirement</b>              | <b>14,465</b>                                      | <b>61,914</b>               | <b>283,899</b>                     |
| Sales Revenue at Current Prescribed Price     | -                                                  | -                           | 211,900                            |
| <b>Total Shortfall in Revenue Requirement</b> | <b>14,465</b>                                      | <b>61,914</b>               | <b>71,999</b>                      |
| Previous year Revenue Shortfall               | -                                                  | -                           | 254,188                            |
| <b>Increase in Revenue Requirement</b>        | -                                                  | -                           | <b>857.40</b>                      |
| Rs/MMBTU w.e.f. July 01, 2021                 |                                                    |                             |                                    |

Besides above, the Petitioner has projected increase at Rs.137.47 per MMBTU w.e.f. July 01, 2021 to cost of service for RLNG business for F.Y. 2021-22. Moreover, the exclusive rights held by the petitioner in its franchise areas i.e. Punjab & Khyber Pakhtunkhwa have expired as per its license, however the petitioner has projected Rs.42,093 million for laying of 11,500 Km distribution mains to connect various new towns and villages.

Oil & Gas Regulatory Authority invites all interested / affected persons including gas consumers and general public to furnish their comments, suggestions and intervention requests, within 14 days from the date of publication of this notice in terms of Rule 7 of the Natural Gas Tariff Rules, 2002. All correspondence in this connection may be addressed to Registrar, OGRA and should contain the names and addresses of applicant.

All interveners must indicate the manner in which they are likely to be affected by determination of the Authority in this case. Intervention request should be accompanied by an affidavit verifying the contents of the intervention, intervention fee of Rs.500/- (demand draft in favour of OGRA) and authority letter if representing an organization.

Copy of the petition can be obtained on payment of prescribed charges of Rs.2/- per page from the office of Registrar, OGRA, Islamabad. For any information required from the Petitioner, please contact:

Mr. Kamran Akram,  
General Manager (RA),  
Sui Northern Gas Pipelines Limited, 21-Kashmir Road  
Lahore Phone No. 042-99201356, Fax: 042-99204424

Registrar,  
Oil & Gas Regulatory Authority  
54-B Faza'le-Haq Road, Blue Area, Islamabad.  
Phone: 051-9244295, 051-9244090-93 (Ext. 157)  
Fax: 051-9244042, Website: www.ogra.org.pk

PID/1514/20

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